

100 South Madison
Denver, Colorado 80209
31) 321-2547

STATE DOCUMENTS COLLECTION

OCT 6 1982

MONTANA STATE LIBRARY
930 E Lyndale Ave.
Helena, Montana 59601

PLEASE RETURN



STATE DOCUMENTS COLLECTION

JUL 22 1981

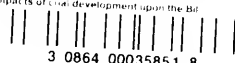
MONTANA STATE LIBRARY
930 E Lyndale Ave.
Helena, Montana 59601

Report

PLEASE RETURN

**IMPACTS OF COAL DEVELOPMENT
UPON THE BILLINGS URBAN AREA**

MONTANA STATE LIBRARY
S 333.82v B12v.1
Impacts of coal development upon the Be



3 0864 00035851 8

MAY 13 1984

MAY 11 1984

IMPACTS OF COAL DEVELOPMENT
UPON THE BILLINGS URBAN AREA

- Prepared for -

Billings-Yellowstone City-County Planning Board

- Prepared by -

Mark C. Wyche, Theodore D. Browne,
Edward F. Harvey and Ford C. Frick
Browne, Bortz & Coddington
100 South Madison Street
Denver, Colorado 80209

August 1980

TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION	vii
SUMMARY	ix
SECTION I. BILLINGS AND YELLOWSTONE COUNTY DEMOGRAPHIC AND ECONOMIC BACKGROUND	1
History	1
Population	1
Population Characteristics	2
Economic Base	3
Summary	11
SECTION II. AREA COAL DEVELOPMENT AND ITS RELATIONSHIP TO BILLINGS	15
Coal Production Trends, 1970 Through 1979	15
The Commercial Relationship of Regional Coal Development in the Billings Area	22
SECTION III. IMPACTS OF REGIONAL COAL DEVELOPMENT	29
Billings Coal Firms	29
Billings Coal Related Industries	30
Billings Growth Indirectly Stimulated by Regional Coal Development--Indirect Impact	38
Historical Effects of Regional Coal Development	45
Summary	52
SECTION IV. FUTURE IMPLICATIONS OF REGIONAL COAL DEVELOPMENT ON BILLINGS	53
Total Population Projections	53
Employment Projections	53
Future Effects of Regional Coal Development	55
Fiscal Effects of Coal Related Population Growth on City Operations	63
Revenue	68
Expenditures	68
Summary of Fiscal Forecasts	70
APPENDIX A. BUSINESS INTERVIEW RESULTS	73
APPENDIX B. SAINT VINCENT HOSPITAL SURVEY	101
APPENDIX C. BILLINGS REVENUES, EXPENDITURES AND PROVISION OF CITY SERVICES	105
REFERENCES	119

LIST OF FIGURES

<u>Figure No.</u>		<u>Page</u>
1	The Billings Primary Service Area, The State of Montana and Northern Wyoming	x
2	Major Operating Coal Mines in the State of Montana and Within the Billings Service Area	16
3	Coal Production Within the Billings Service Area 1970 to 1990	25
4	Billings Urban Area Employment Growth in Coal Related Industries Directly Attributable to Coal Development from 1972 to 1979	34
5	Billings Urban Area Employment in Coal Related Industries, Directly Attributable to Regional Coal Development from 1972 through 1979	39
6	Billings Urban Area Basic Employment Growth Attributable to Coal Related Employment in Coal Linked Industries from 1972 to 1979	40
7	Billings Urban Area Basic Employment Growth Attributable to Indirect Coal Related Employment from 1972 to 1979	44
8	Billings Urban Area Basic Employment Attributable to Regional Coal Development in 1979	46
9	Billings Urban Area Basic Employment Growth Attributable to Regional Coal Development from 1972 to 1979	47
10	Projected Billings Urban Area Basic Employment Growth Attributable to Regional Coal Development from 1979 through 1990	59
11	Projected Billings Urban Area Employment Growth Attributable to Regional Coal Development from 1979 through 1990	61
12	Forecasted Billings Urban Area Population Growth Attributable to Regional Coal Development from 1979 through 1990	65

LIST OF TABLES

<u>Table No.</u>		<u>Page</u>
1	Yellowstone County Personal Income by Industry 1972 through 1978	4
2	Adjusted Annual Average Billings and Yellowstone County Labor Force, Employment and Unemployment by Industry for 1972 through 1979	5
3	Basic and Local Service Billings and Yellowstone County Employment for 1972 through 1979	6
4	Selected Economic Indicators for Billings and Yellowstone County, 1970 through 1979	12
5	Recent Coal Production Trends in the Billings Service Area	17
6	Montana Coal Mining Employment by County 1970 to 1979	18
7	Selected Historical Data about Coal Operations in the Billings Service Area	19
8	Planned New Coal Developments in Montana and Sheridan County, Wyoming	23
9	Coal Production and Employment Forecasts Within the Billings Service Area through 1990	24
10	Annual Average Billings and Yellowstone County Employment in Coal Related Industries for 1972 through 1979	32
11	Billings and Yellowstone County 1979 Coal Related Industry Employment Related to Coal Development	33
12	Billings and Yellowstone County 1979 Basic Employment Attributable to Indirect Coal Related Employment	43
13	Basic and Local Service Employment Attributable to Coal Development in Billings and Yellowstone County, 1972 through 1979	49
14	Historical Demographic Effects of Regional Coal Development on the Billings Urban Area, 1972 through 1979	50

LIST OF TABLES (CONTINUED)

15	Billings Urban Area Population and Household Growth Attributable to Regional Coal Development from 1972 through 1979	51
16	Population and Related Forecasts for the Billings Urban Area, 1979 through 1990	54
17	Projected Basic and Local Service Billings Urban Area Employment for 1980 through 1990	56
18	Projected Basic and Local Service Billings Urban Area Employment Attributable to Regional Coal Development from 1979 through 1990	60
19	Demographic Effects of Regional Coal Development on the Billings Urban Area from 1979 through 1980	62
20	Billings Urban Area Population and Household Growth Attributable to Regional Coal Development from 1979 through 1990	64
21	Annual General Fund Revenue Estimates, City of Billings for Fiscal Years 1980-1990 (Thousands of Dollars).	66
22	Annual Expenditure Estimates for City of Billings Operations for Fiscal Years 1980-1990 (Thousands of Dollars)	67
B-1	Geographic Distribution of Patients at Saint Vincent Hospital	102
B-2	Coal-Related Patients and Patient's Guarantor At Saint Vincent Hospital	103
C-1	City of Billings Revenue Growth By Source (\$000's)	108
C-2	City of Billings Expenditures by Function (\$000's)	110

INTRODUCTION

The Billings-Yellowstone City-County Planning Board announced on July 17, 1979 that it desired a study about direct and secondary impacts caused by regional coal development. The study area was defined as the City of Billings and its Jurisdictional Area, which covers a four and one-half mile radius surrounding Billings. The study commenced in mid-November 1979, and the funding source was the Montana Coal Board.

Several interrelated steps were taken in order to determine the geographic area served by Billings, measure economic change over recent years in the Billings area, evaluate proposed and present coal development in Montana and northern Wyoming, and to estimate impacts associated with regional coal activity.

Personal business and government interviews were conducted with over 230 organizations during the course of this research. Of these, slightly over 200 were performed with public and private organizations in or near Billings (see Appendix A). The purpose of the latter interviews was to identify those industry groups within the Billings economic base which have economic linkages with the regional coal industry. Although all industry sectors were interviewed, emphasis was placed upon groups or firms with a meaningful portion of their business or activity attributable to coal development. In certain cases such as retail trade; service; or finance, insurance and real estate, it was almost impossible to isolate coal related sales or receipts. By contrast, wholesale trade represented one sector with clear and measurable ties to the coal industry. Verification of the interview results was possible in a number of instances through the comparison of purchasing records from three surface coal mines for Billings area goods and services. In addition, a survey of Saint Vincent Hospital inpatient files (see Appendix B) was an input in measuring its service area and coal related impacts. Interviews with coal operators and representatives of the Crow Tribe were especially helpful.

Population and employment data were largely secured from two sources. For population figures since 1970, figures were obtained from studies by the Billings-Yellowstone City-County Planning staff. The Montana Employment Security Division in Helena supplied considerable employment data; unpublished Standard Industrial Classification (SIC) data were provided at the three and four digit level.

The analysis considered and evaluated data collected through primary techniques as well as secondary sources. Incremental effects were identified for employment, population and households in the Billings Urban Area based upon regional coal development. Impacts were compared with future growth to illustrate the proportion of socioeconomic influence which coal has had, or will have, upon the Billings community. As part of this analysis, both private and public sector impacts were examined. Appendix C provides more detailed information about the public sector. Footnotes follow the appendices.

A number of people and organizations assisted in the performance of this research. The project monitor was Joanne Garnett, Assistant Director,

Advance Planning, Billings-Yellowstone City-County Planning Board; her guidance and suggestions represented a substantial aid throughout the performance period. The staff of the Montana Employment Security Commission was cooperative in providing detailed employment data. Mike Ross assisted in field work with the Crow Tribe. The Carter Mining Company, Peabody Coal Company and Westmoreland Resources provided important procurement and other information. The businesses and government agencies that participated in the extensive field work supplied key inputs. The help of all of the above people and organizations is greatly appreciated.

SUMMARY

The City of Billings, the largest community in Montana, serves as the primary trade, service, transportation and financial center for a large area encompassing southern Montana and northern Wyoming. The primary service area is outlined on Figure 1.

Billings and Yellowstone County employment has expanded by 48 percent from 1970-1979. The unemployment rate has been below the state average in recent years, reflective of the area's growing economy. The major contributors to the county's economic base are trade, services and government. The trade and service sector accounted for two-thirds of the county's employment growth between 1972 to 1979. Manufacturing, agriculture and transportation also serve regional markets from the Billings area.

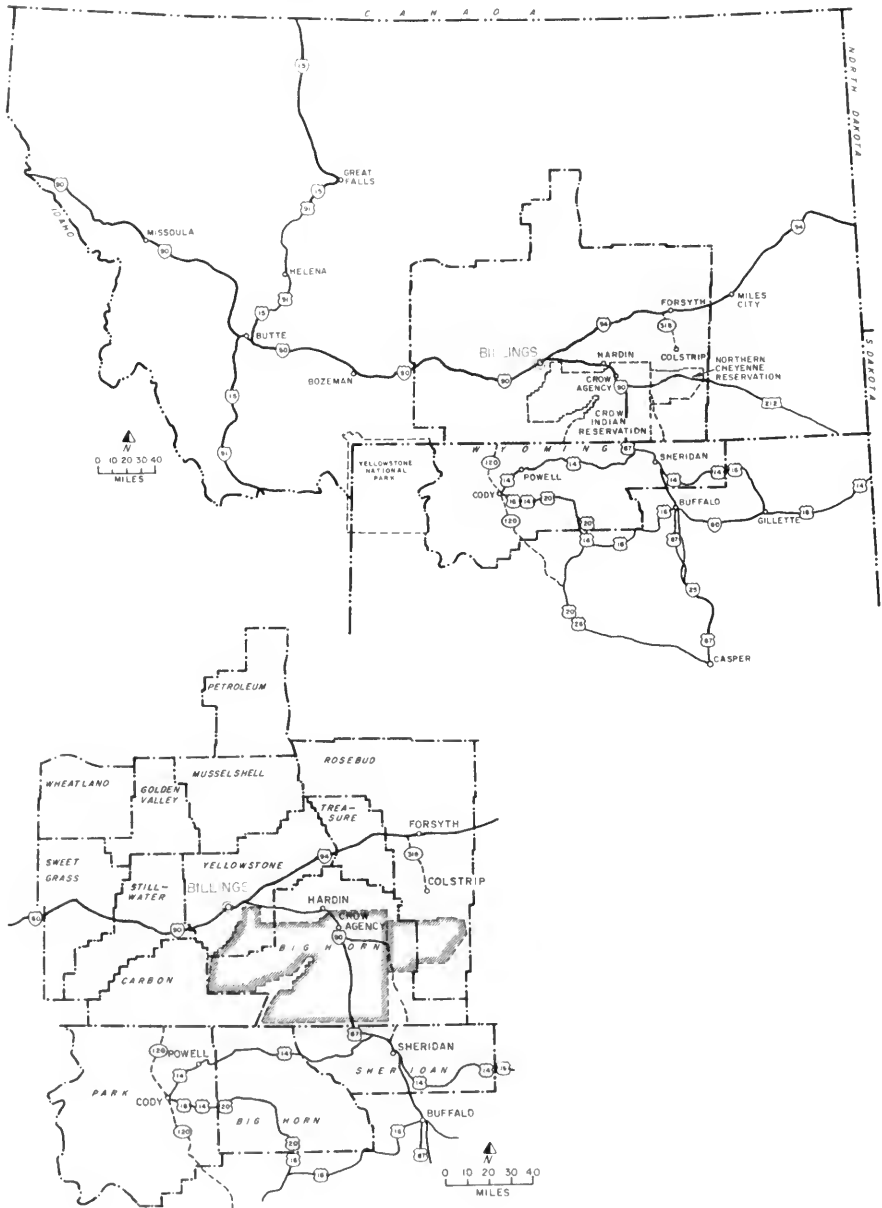
Personal income patterns reflect the economic base of Yellowstone County. Personal income by major industry increased from \$330 million in 1972 to \$663 million for 1978. The trade sector accounted for one-quarter of the earned income. Services, the second largest earned income source, had a 17.3 percent share in 1978. On a per capita basis, the 1970 figure was \$3,751 compared with a 1978 level of \$8,008. Income gains are partially related to enlarged employment opportunities, a higher labor participation rate and low unemployment levels.

An important stimulant to economic growth in the Billings area has been the steady development of coal reserves in southeastern Montana and Sheridan County, Wyoming. Within this service area, coal production increased from 2.5 million tons to 35.1 million tons from 1970 to 1979. Of the latter output, Montana mines accounted for slightly over 90 percent. Looking ahead to 1990, coal development is anticipated to exceed 86 million tons per year with 3,340 workers employed in coal operations. Even though a very small proportion of these employees will live in the Billings area, these workers and their employers will have important commercial relationships with the Billings community.

Economic development within the defined Billings service area has caused additional employment within the Billings Urban Area as local businesses expand in order to serve new firms and new residents locating in the rural service area. Three types of employment attributable to regional coal development within the basic employment sectors of the Billings economy have been defined:

- Coal firm employment--direct impact--this is employment within coal firms or coal producing companies located in the Billings area. Direct employment represents a very modest impact on the Billings area economy.
- Coal related industry employment--secondary impact--this employment is in Billings area industries which sell their products or services directly to coal companies located in the Billings service area.

FIGURE 1. THE BILLINGS PRIMARY SERVICE AREA, THE STATE OF MONTANA AND NORTHERN WYOMING



Note Shaded portion represents the Billings Primary Service Area

- Indirect employment growth--indirect impact--represents that portion of the Billings economy which serves coal related employees residing in the Billings service area. For example, coal mining employees living in Colstrip will generate additional employment in Billings as they utilize that city for entertainment, retail or personal services.

Of the 44,420 persons employed in 1979 in the Billings Urban Area, approximately 3,400 employees, or about eight percent of total employment, can be attributed to regional coal development. This represents approximately 7,340 people residing in 2,680 households. Regional coal development has accounted for almost one-third of the population growth from 1972 to 1979 in the Billings Urban Area. Population associated with regional coal development increased almost fivefold--5,820 people--while Billings Urban Area population grew by 19,200 people over the past seven years.

It is anticipated that future coal development in the Billings service area will continue to induce new employment opportunities in the Billings Urban Area. Employment occurring in Billings as a result of future regional coal development is anticipated to increase from 3,380 persons in 1979 to over 7,500 persons by 1990. By 1990, total employment in the Billings Urban Area is forecasted to increase by 18,120 persons; approximately one-quarter of this growth will be due to regional coal development. Employment growth induced in Billings as a result of regional coal development will occur in a number of employment sectors and among a range of incomes. This growth, in terms of its demographic characteristics, is largely indistinguishable from other community growth.

The City of Billings has experienced financial difficulties for a number of years. Historically, expenditures and revenues have been balanced only by reducing service levels and the city's success in attracting federal grants. Demands for city services from a growing population will continue to outstrip the city's financial resources for the foreseeable future. Unless new sources of revenue are identified, services for both old and new residents will continue to decline.

As Montana's largest community and primary service center, Billings, in effect, provides a large number of services for many nonresidents. People from southern Montana and northern Wyoming utilize Billings as a shopping, service and entertainment center. This has the beneficial effect of generating local employment. It also places increased demands on the city, particularly for transportation maintenance costs, but also for police, fire, library, recreation or other services.

Many communities with regional service based economies rely heavily on sales tax receipts to support city operations. Typically, a regional service center will receive a large portion of its general revenue from sales tax collections, thus sharing the tax burden among a larger group of service users. The prohibition against sales tax in Montana has particularly adverse effects on the City of Billings.

The City of Billings finds itself in the position of many towns in growth areas. The city will grow as a result of coal development by approxi-

mately 800 persons per year from 1980 to 1990. These new residents require a full complement of services from a community already experiencing fiscal imbalances. Property tax revenues from coal developments accrue entirely to other jurisdictions, and severance tax revenues flow to the state for redistribution. The city receives local property tax receipts and general local service fees to pay for services. In other states, a community in Billings' position would derive revenues from sales tax receipts to provide for new growth. Billings finds itself unable to generate sufficient local revenues to fully accommodate pressures partially caused by coal induced demands.

The Billings infrastructure is of sufficient magnitude to absorb anticipated growth without a discontinuity. Major infrastructure components, related to water, sewer, solid waste and protection services, are in suitable condition; there is not an immediate need beyond current plans for large capital investment in order to ensure continued service. This circumstance will allow the city to continue to absorb new growth and avoid the necessity for impact mitigation assistance from private sources. City operating expenses and replacement capital costs remain an uncovered expense. Given present tax structures and fee schedules, the costs of growth will exceed the local revenue generated. This situation suggests that a case can be made by Billings to share in certain Montana coal severance tax receipts.

SECTION I. BILLINGS AND YELLOWSTONE COUNTY DEMOGRAPHIC AND ECONOMIC BACKGROUND

Billings, the state's largest city, is in Yellowstone County situated in the south central portion of Montana. Billings serves as the transportation, trade and financial center of southern Montana and northern Wyoming. This section examines Billings and Yellowstone County, emphasizing population trends, demographic characteristics and the economic base.

History

The Yellowstone Valley was first explored by Lewis and Clark in 1805.(1) Indian struggles hindered settlement of the area until the late 1870's. Rapid growth occurred after the Northern Pacific Railroad established a major depot at what is now Billings. The city itself is named for Fred Billings, president of the railroad at that time. Billings became known as the "Magic City" because population growth was so rapid during the late 1800's. The Billings economy in these early years depended primarily upon trade, agriculture and manufacturing. These basic industries still exert a major influence today.

Population

From 1950 to 1960, both Billings and Yellowstone County experienced substantial population increases, with an average annual growth rate of 5.2 percent and 3.5 percent, respectively. Between 1960 and 1970, population in the City of Billings and Yellowstone County continued to experience growth, but at a more modest rate of 1.5 percent and 1.0 percent average annual growth rate, respectively.

Billings and Yellowstone County population data from 1950 through 1970 are:(2)

Year	City of Billings	Billings Urban Area	Yellowstone County
1950	31,834	43,520	55,875
1960	52,851	66,135	79,016
1970	61,581	74,848	87,367

The Billings Urban Area is defined as the area immediately surrounding the city, (slightly over a four mile radius) which contains at least 1,000 residents per square mile. It excludes Laurel. The Urban Area generally coincides with the geographic area considered for evaluation of coal-related impacts.

During the past decade Yellowstone County population has increased approximately 21,700, to an estimated 1979 population of 109,100 persons. This

represents a steady average annual increase of 2.5 percent over the past nine years. Population growth from 1970 to 1979 is:(3)

Year	City of Billings	Billings Urban Area(4)	Yellowstone County
1970	61,581	72,900	87,367
1975	69,900	83,800	98,600
1976	72,700	86,700	100,300
1977	74,840	89,600	102,000
1978	76,600	92,700	105,500
1979	79,130	96,300	109,100

The City of Billings has grown by over 17,500 persons, or almost 29 percent since 1970. The City of Billings population as a percentage of the county's total population has increased slightly from 70 percent in 1970 to approximately 73 percent in 1979. In that same period, the Billings Urban Area population as a percentage of the county's total population has increased from 83 percent to approximately 88 percent indicating that a large portion of the county's growth has occurred near the City of Billings.(5)

Population Characteristics

The number of households in Billings and Yellowstone County has increased over one-third since 1970, while the persons per household ratios have declined in recent years. As of 1979, Billings has estimated households of 28,800 while the county total has grown to 38,690 households. The Billings Urban Area has approximately 35,150 households as of 1979. Persons per household for the Billings Urban Area has decreased from 3.25 persons in 1970, to 2.74 persons in 1979.(6)

The median age for Yellowstone County and Billings was 26.2 years as of 1970.(7) In March 1979, the Billings-Yellowstone City-County Planning Board published Housing Element of the Billings Area Comprehensive Plan, which estimated the median age of Billings residents to be approximately 28 years as of 1976.

Income. Per capita income of Yellowstone County residents increased at a 9.9 percent average annual rate from 1970 to 1978:(8)

Year	Yellowstone County Residents Per Capita Income
1970	\$3,751
1971	3,918
1972	4,417
1973	4,693
1974	5,425
1975	5,908
1976	6,331
1977	7,185
1978	8,008

In 1978, Yellowstone County per capita income exceeded the state average by 15.8 percent.

Economic Base

Income by industry. Personal income by industry reflects the major contributors to the economic base of Yellowstone County. Personal income by industry for Yellowstone County, as published by the Bureau of Economic Analysis, is set forth in Table 1. Important individual economic sectors to the overall Yellowstone County economy include:

- The trade sector is the largest economic sector in terms of income. In 1978, trade accounted for over one-quarter of Yellowstone County's labor and proprietor's income computed on a place of work basis.
- Services with 17.3 percent of 1978 labor and proprietor's income is the second largest income source. In 1978, trade and services together accounted for 43.4 percent, or close to one-half of the county labor and proprietor's income.
- Farm income has declined in both relative and absolute terms since 1972.

Total Yellowstone County personal income by major industry has increased from \$330.1 million in 1972, to \$663.0 million in 1978. This represents an average annual increase of 12.3 percent.

Employment. Trade, services and government accounted for more than two-thirds of Billings and Yellowstone County employment during 1979. Yellowstone County and Billings Urban Area employment growth by major industrial sector for the years 1972 to 1979 is shown on Table 2.

Billings and Yellowstone County has experienced employment growth from 1972 to 1979. As of 1979, 51,300 people were employed from a total labor force of 53,270 residing in Yellowstone County. Approximately 87 percent of the county's labor force resides in the Billings Urban Area. Employment in Billings and Yellowstone County grew 49 percent in the seven year period from 1972 to 1979. The unemployment rate in the county has averaged 4.5 percent over the past eight years, which is below the state average of 5.6 percent during this same time period.

All employment sectors except mining experienced actual growth from 1972 to 1979. The largest growth sectors in the Billings Urban Area include trade (5,700 new employees), service (3,000 new employees) and government (1,800 new employees). Trade and service employment accounted for 60 percent of the Billings Urban Area total employment growth and over one-half of the county's employment growth.

Basic and non-basic employment. Table 3 sets forth 1972 through 1979 annual average Yellowstone County and Billings Urban Area employment, divided into basic and non-basic (or induced) categories. Basic industries are those which provide goods and services for persons or markets beyond the local area.

TABLE 1. YELLOWSTONE COUNTY PERSONAL INCOME BY INDUSTRY 1972 THROUGH 1978

Industry	Thousands			
	1972	1974	1976	1978
Farm*	\$ 20,315	\$ 15,680	\$ (8,944)	\$ 4,494
Mining	4,423	8,253	7,545	9,102
Construction	27,441	37,026	49,293	61,849
Manufacturing	39,240	48,574	54,931	78,618
Transportation, communications and public utilities	40,276	50,201	65,578	84,994
Wholesale and retail trade	78,189	105,374	132,757	172,652
Finance, insurance and real estate	15,706	17,502	25,597	35,884
Services	52,006	65,579	86,939	114,968
Other industries	1,311	1,510	1,079	1,588
Government	<u>51,188</u>	<u>64,157</u>	<u>76,821</u>	<u>98,848</u>
Total**	\$330,095	\$413,856	\$491,596	\$662,997

*Personal income produced by the farm sector has shown a substantial decrease because of large inventory write-offs, matched with low generated farm income for the State of Montana. Interview with Andy Weiser, Farm Income Section, Regional Income Bureau, Washington, D.C., March 1980.

**This represents Total Labor and Proprietors Income By Place of Work.

Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information Systems, Personal Income By Major Source, selected print-outs.

TABLE 2. ADJUSTED ANNUAL AVERAGE BILLINGS AND YELLOWSTONE COUNTY LABOR FORCE,
EMPLOYMENT AND UNEMPLOYMENT BY INDUSTRY FOR 1972 THROUGH 1979*

Industry Group	1972			1973			1974			1975			1976			1977			1978			1979		
	Yellow- stone County	Billings Urban Area	Area	Yellow- stone County	Billings Urban Area	Area	Yellow- stone County	Billings Urban Area	Area	Yellow- stone County	Billings Urban Area	Area	Yellow- stone County	Billings Urban Area	Area	Yellow- stone County	Billings Urban Area	Area	Yellow- stone County	Billings Urban Area	Area	Yellow- stone County	Billings Urban Area	Area
Agriculture	1,000	250		1,700	430		1,800	450		1,600	400		1,600	400		1,600	400		1,500	380		1,500	380	
Mining	300	240		300	240		400	320		300	240		300	240		300	240		300	240		300	240	
Construction	2,000	1,800		1,900	1,700		2,200	2,000		2,000	1,800		2,100	1,900		2,800	2,500		2,600	2,300		2,700	2,400	
Manufacturing	3,400	3,100		3,700	3,300		3,800	3,400		3,400	3,100		3,600	3,200		3,600	3,200		4,200	3,800		4,400	4,000	
Transportation, communications and public utilities	3,200	2,400		3,600	2,700		3,500	2,600		3,500	2,600		3,400	2,600		3,700	2,800		4,100	3,100		4,800	3,600	
Wholesale and retail trade	9,700	8,700		10,100	9,100		11,700	10,500		12,600	11,300		13,200	11,900		14,200	12,800		15,400	13,900		16,000	14,400	
Finance, insur- ance and real estate	1,600	1,400		1,700	1,500		1,600	1,400		1,900	1,700		2,100	1,900		2,000	1,800		2,200	2,000		2,300	2,100	
Services	6,200	5,600		7,000	6,300		6,500	5,900		7,800	7,020		8,000	7,200		8,000	7,200		9,000	8,100		9,600	8,600	
Government	5,700	5,100		5,800	5,200		6,600	5,900		7,300	6,600		7,600	6,800		8,500	7,700		7,700	6,900		7,700	6,900	
Other	1,300	1,200		1,400	1,300		1,500	1,400		1,600	1,400		1,700	1,500		1,800	1,600		1,900	1,700		2,000	1,800	
Total Resident Employment	34,400	29,790		37,200	31,770		39,600	33,870		42,000	36,160		43,600	37,640		46,500	40,240		48,900	42,420		51,300	44,420	
Unemployment Rate	4.5%	4.5%		4.1%	4.1%		4.2%	4.2%		5.3%	5.3%		4.8%	4.8%		4.8%	4.8%		4.7%	4.7%		3.7%	3.7%	
Labor Force	36,020	31,190		38,790	33,130		41,340	35,350		44,350	38,180		45,800	39,540		48,840	42,270		51,310	44,510		53,270	46,130	

*The employment and labor force figures shown above represent annual covered and non-covered employment for residents of Yellowstone County and the Billings Urban Area. Yellowstone County figures are based upon employment data published by the Montana Employment Security Division, Department of Labor and Industry. Although the state data are compiled by place of work rather than place of residence, in-migration and out-migration of county work force is not a major occurrence. According to the 1970 Census of Population, General, Social and Economic Characteristics, Montana, approximately two percent of Yellowstone County employment resides outside the county. Montana Employment Security Division data have been adjusted to include agriculture employment and "other" employment, which includes self-employed, unpaid family workers and domestic workers. "Other" employment is estimated to represent four percent of total county employment, based on personal income data compiled by the U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information Systems, 1972-1978. Mining employment has been disaggregated from service employment based on detailed SIC data provided by the Montana Employment Security Division. The allocation of Billings Urban Area employment by industrial sector was based on: U.S. Bureau of the Census, 1970 Census of Population, General Social and Economic Characteristics, Montana, p. 165; known residence distribution; geographic location of certain industries; and interviews with selected employers.

TABLE 3. BASIC AND LOCAL SERVICE BILLINGS AND YELLOWSTONE COUNTY EMPLOYMENT FOR 1972 THROUGH 1979*

Industry Group	1972			1973			1974			1975			1976			1977			1978			1979		
	Yellowstone County	Billings Urban Area	Yellowstone County	Yellowstone County	Billings Urban Area	Yellowstone County	Yellowstone County	Billings Urban Area	Yellowstone County	Yellowstone County	Billings Urban Area	Yellowstone County	Yellowstone County	Billings Urban Area	Yellowstone County	Yellowstone County	Billings Urban Area	Yellowstone County	Yellowstone County	Billings Urban Area	Yellowstone County	Yellowstone County	Billings Urban Area	Yellowstone County
Basic Employment Sectors																								
Agriculture	1,000	250	1,700	430	1,800	450	1,600	400	1,600	400	1,600	400	1,600	400	1,600	400	1,600	380	1,500	380	1,500	380	1,500	380
Mining	300	240	300	240	400	320	300	240	300	240	300	240	300	240	300	240	300	240	300	240	300	240	300	240
Construction	700	630	700	630	790	720	780	700	800	720	800	720	800	720	980	880	1,090	970	1,090	970	1,090	970	1,090	970
Manufacturing	2,520	2,290	2,590	2,310	2,580	2,310	2,210	2,020	2,590	2,300	2,300	2,050	2,300	2,050	2,300	2,050	2,300	2,050	2,300	2,050	2,300	2,050	2,300	2,050
Transportation, communications and public utilities																								
Wholesale and retail trade	1,600	1,200	1,690	1,270	1,720	1,270	1,700	1,270	1,800	1,380	1,810	1,370	2,090	1,560	2,540	1,910	2,090	1,560	2,540	1,910	2,090	1,560	2,540	1,910
Finance, insurance and real estate	3,780	3,390	3,940	3,550	4,680	4,200	5,170	4,630	5,540	5,000	5,960	5,380	6,470	5,840	6,880	6,190	6,470	5,840	6,880	6,190	6,470	5,840	6,880	6,190
Government	160	140	170	150	160	140	190	170	210	190	200	180	220	200	230	210	220	200	230	210	220	200	230	210
Services	2,230	2,020	2,590	2,330	2,470	2,240	2,960	2,670	3,040	2,740	3,040	2,740	3,040	2,740	3,040	2,740	3,040	2,740	3,040	2,740	3,040	2,740	3,040	2,740
Other	2,050	1,840	2,200	1,980	2,570	2,300	3,210	2,900	3,040	2,720	3,150	2,850	2,540	2,280	2,460	2,210	2,540	2,280	2,460	2,210	2,540	2,280	2,460	2,210
	130	120	140	130	150	140	160	140	170	150	180	160	190	170	200	180	190	170	200	180	190	170	200	180
Subtotal	14,470	12,120	16,020	13,020	17,320	14,090	18,280	15,140	19,090	15,840	19,520	16,250	20,540	17,210	21,520	17,990	20,540	17,210	21,520	17,990	20,540	17,210	21,520	17,990
Local Service Sectors																								
Construction	1,300	1,170	1,200	1,070	1,410	1,280	1,220	1,100	1,300	1,180	1,820	1,620	1,510	1,330	1,700	1,510	1,510	1,330	1,700	1,510	1,510	1,330	1,700	1,510
Manufacturing	880	810	1,110	990	1,220	1,090	1,190	1,080	1,010	900	1,300	1,150	1,390	1,250	1,540	1,400	1,390	1,250	1,540	1,400	1,390	1,250	1,540	1,400
Transportation, communications and public utilities																								
Wholesale and retail trade	1,600	1,200	1,910	1,430	1,780	1,330	1,800	1,330	1,600	1,220	1,890	1,430	2,010	1,520	2,260	1,690	2,010	1,520	2,260	1,690	2,010	1,520	2,260	1,690
Finance, insurance and real estate	5,920	5,310	6,160	5,550	7,020	6,300	7,430	6,670	7,660	6,900	8,240	7,420	8,930	8,060	9,120	8,240	8,930	8,060	9,120	8,240	8,930	8,060	9,120	8,240
Government																								
Other	1,440	1,260	1,530	1,350	1,440	1,260	1,710	1,530	1,890	1,710	1,800	1,620	1,980	1,800	2,070	1,890	1,980	1,800	2,070	1,890	1,980	1,800	2,070	1,890
Services	3,970	3,580	4,410	3,970	4,030	3,660	4,840	4,350	4,960	4,460	4,960	4,460	5,670	5,100	6,050	5,420	5,670	5,100	6,050	5,420	5,670	5,100	6,050	5,420
Government	3,650	3,260	3,600	3,220	4,030	3,600	4,090	3,700	4,560	4,080	5,350	4,850	5,160	4,620	5,240	4,690	5,160	4,620	5,240	4,690	5,160	4,620	5,240	4,690
Other	1,170	1,080	1,260	1,170	1,350	1,260	1,440	1,260	1,530	1,350	1,620	1,440	1,710	1,530	1,800	1,620	1,710	1,530	1,800	1,620	1,710	1,530	1,800	1,620
Subtotal	19,930	17,670	21,180	18,750	22,280	19,780	23,720	21,020	24,510	21,800	26,980	23,990	28,360	25,210	29,780	26,430	28,360	25,210	29,780	26,430	28,360	25,210	29,780	26,430
Total Employment	34,400	29,790	37,200	31,770	39,600	33,870	42,000	36,160	43,600	37,640	46,500	40,240	48,900	42,420	51,300	44,420	48,900	42,420	51,300	44,420	48,900	42,420	51,300	44,420
Local Service To Basic Ratio	1.38	1.46	1.32	1.44	1.29	1.40	1.30	1.39	1.28	1.38	1.38	1.48	1.38	1.46	1.38	1.47	1.38	1.46	1.38	1.47	1.38	1.46	1.38	1.47

*The above employment data are obtained from the Montana Employment Security Division as presented in Table 2. Allocation of basic and local service categories is based upon unpublished 1972 through 1979 Montana Employment Security Division data by three and four digit SIC code; and interviews with local business persons, winter and spring 1980.

The local area is defined as Yellowstone County for both the county and the Billings Urban Area. Other industries that serve these basic industries, one another, and the area's populace, are termed non-basic, local service or induced. The basic component represents the underlying stimulant of economic, employment and population growth in Billings and Yellowstone County.

In practice, few employment sectors are exclusively basic or local service. Retail trade, principally a local service industry, also includes gasoline service stations and motels which serve tourists and other non-residents, and highway-related traffic. Wholesale trade is also primarily a local service industry; however, in Yellowstone County a major percentage of the wholesale trade is conducted outside the county. A portion of Yellowstone County's wholesale employment would be included in the basic sector. Manufacturing, often viewed as a basic industry, includes the local newspaper, bakeries and welding shops which sell mostly to county residents.

In this study, the division of each industrial sector into basic and local service employment was accomplished after an examination of detailed employment data provided by the Montana Employment Security Division, and interviews with selected local businesses.

The basic/non-basic relationship is typically evaluated by the employment multiplier. The latter relates the total level of economic activity in an area to its base or so-called "export" activities. The approach applied here aggregates all non-basic industries and divides this sum by total basic employment. In other words, the employment multiplier applied in this report indicates the level of local service employment induced by basic employees living in Yellowstone County or the Billings Urban Area in a given year. The trends in this employment multiplier indicate the extent of local service response to changes in basic employment. The Billings Urban Area employment multiplier is incorporated in forecasts of Billings employment in subsequent sections.

Of the 51,300 persons employed and residing in Yellowstone County in 1979, 21,520 persons were classified as basic employment while 29,780 persons were employed in non-basic or local service positions. This represents a 1.38 local service multiplier; in other words, for every basic job in the county, there exists about 1.38 additional non-basic positions. In comparison, the Billings Urban Area had a 1.47 local service multiplier, reflecting the lower concentration of the basic industry of agriculture, and a higher percent of the local service sectors of trade and services, located in the City of Billings.

The number of basic sector jobs held by persons working and residing in Billings or Yellowstone County have both increased approximately 50 percent between 1972 and 1979. Service employment grew at the same pace reflecting a fairly steady growth pattern in the basic sectors of the economy which has allowed the local service sectors to keep pace.

Trade. Retail and wholesale trade comprise the largest Yellowstone County employment sector during 1979 with 31 percent of the county employment. The 16,000 persons employed in this sector in 1979 represents an increase of 65 percent over the 1972 level.

Yellowstone County retail businesses are concentrated in the City of Billings. According to the 1977 Census of Retail Trade, 812 of the county's 1,072 retail establishments are located in the city:(9)

	Retail Trade			
	Billings		Yellowstone County (Billings SMSA)	
	1972	1977	1972	1977
Number of establishments	778	812	1,028	1,072
Sales (millions)	\$220.4	\$424.3	\$257.3	\$513.9
Annual payroll (millions)	\$ 26.9	\$ 52.1	\$ 31.3	\$ 61.4

The number of retail establishments in Yellowstone County increased by four percent from 1972 to 1977; sales almost doubled over this five year period. Billings SMSA's 1977 retail sales of \$513.9 million represented 18 percent of Montana's retail sales. This compares with the Great Falls SMSA which had retail sales of \$364.0 million or 13 percent of the state's retail sales.

Breaking down sales and establishments by category demonstrates that automotive services, food stores and building materials are the dominant components of the Yellowstone County retail sector:(10)

Category	Yellowstone County, 1977	
	Number of Establishments	Retail Sales (millions)
Building materials and hardware	71	\$ 57.4
General merchandise	17	Withheld
Food stores	90	90.3
Automotive Services	192	144.7
Apparel and accessory	94	26.1
Furniture	100	26.5
Eating and drinking	209	42.5
Miscellaneous stores	299	34.9
Retail Total	1,072	\$513.9

In 1977, 349 wholesale trade establishments operated in Yellowstone County, an increase of 54 since 1972. Fifty-one of these new establishments located in Billings:(11)

	Wholesale Trade					
	Billings		Yellowstone County		County as Percent of State	
	1972	1977	1972	1977	1972	1977
Number of establishments	202	253	295	349	16.4%	19.2%
Sales (millions)	\$233.2	\$643.4	\$417.3	926.7	26.5	31.2
Annual payroll (millions)	\$ 15.2	\$ 35.7	\$ 26.5	\$ 53.2	28.7	32.8

The wholesale trade area of influence for Billings and Yellowstone County extends beyond the area served by local retail outlets. In 1977, Billings SMSA population represented approximately 14 percent of Montana's population; however, Billings SMSA's wholesale sales account for almost one-third of the state's wholesale sales during this year. By comparison, the Great Falls SMSA represented 11 percent of the state's population in 1977, and accounted for 21 percent of the state's sales in this category. Based upon these data and the personal interviews, a large proportion of Billings wholesale trade employment represents a basic sector of the area's economy because of the large geographic areas served by Billings' establishments.

Services. The service sector of the Yellowstone County economy is the second largest employer. In 1979, almost 19 percent of the county's employment was in the service sector. Over 80 percent of the total receipts generated by service establishments in Yellowstone County were received by Billings organizations. From 1972 to 1977 Yellowstone County service receipts grew by 117 percent:(12)

	Service Industries			
	Billings		Yellowstone County	
	1972	1977	1972	1977
Number of establishments	752	968	967	1,259
Receipts (millions)	\$42.5	\$88.2	\$50.7	\$110.1

As in the case of trade, the Billings area of influence for services extends well beyond Yellowstone County. The 1,259 service establishments in Yellowstone County had 1977 receipts of \$110.1 million, or 24.5 percent of the Montana receipts. From an employment viewpoint, the two large Billings hospitals are major influences in this sector; their receipts are excluded from the above service sector dollar figures.

Government. The government sector of the Yellowstone County economy represents 15 percent of the total employment in the county. Government employment is largely divided among four entities:(13)

- a. The Yellowstone County Public Schools employ 1,000 persons.
- b. The City of Billings has a year-round employment level of 695.
- c. Yellowstone County has 400 employees.
- d. Federal Government employment approximates 1,500 in Yellowstone County. Of these, 440 are associated with the Post Office. The Bureau of Land Management, and the Water and Power Resource Service (formerly the Bureau of Reclamation) each have over 200 employees.

Manufacturing. Approximately nine percent of Yellowstone County's employment is in the manufacturing sector. Manufacturing activity is concentrated into two categories. The food processing industry has three large plants. Three oil refineries comprise the other large industry.(14)

Three major Billings employers in agricultural related activities fall in the manufacturing category. Midland Empire Packing Company has 210 employees while the Pierce Packing Company employment level is 475. In addition to the two large meat packing plants, about 340,000 tons of sugar beets are processed annually by Great Western Sugar where 130 year-round employees are aided by over 400 seasonal workers during the campaign.

Two of the three Yellowstone County oil refineries are located in Billings. CENEX is located in Laurel, and its 260 employees process approximately 40,000 barrels daily. EXXON also has 300 employees while CONOCO employs 220. Billings SMSA accounts for over 80 percent of Montana's employment in the manufacturing of petroleum or coal products.(15)

The above organizations serve regional markets and largely represent basic industries within the Billings economy.

Agriculture. Although income data for Yellowstone County indicate a decreasing agriculture base, the area still includes agriculture as a basic sector of the county's economy. The 1974 Census of Agriculture provides the following statistics for Yellowstone County:(16)

	1969	1974
Number of Farms	1,139	1,035
Land in Farms (acres)	1,612,068	1,385,365
Average Size of Farms (acres)	1,415	1,339
Average Value per Acre	\$72	\$154
Value of all Farm Products (thousands)	\$40,524	\$67,249

Yellowstone County's 1977 ranking in crop production and cash receipts in comparison with the rest of Montana's 56 counties is:(17)

	Rank (1977)
<u>Cash Receipts</u>	
All Agricultural Products	2
Livestock and Related Products	1
Crops	13
<u>Crop Production</u>	
All Wheat	18
Barley	15
All Hay	16

Transportation, Communication and Public Utilities. In 1979, nine percent of the Yellowstone County work force was employed in the Transportation, Communication and Public Utility sector. As of 1979, 146 Yellowstone County business establishments operated in this sector. Of these, 90 were involved in

trucking and warehousing.(18) Over one-third of Montana's employment in trucking and warehousing is located in Yellowstone County.(19)

The Burlington Northern Railroad (BNR) Company is the largest employer in this sector. Approximately 700 persons are employed by the BNR in Billings plus another 800 persons working in Laurel.(20)

Other economic indicators. Several economic indicators reflect community growth in Billings and Yellowstone County.

Based upon information maintained by the City of Billings Building Department, substantial residential construction has occurred over recent years in the Billings Jurisdictional Area:

Year-End	<u>Single Family</u>		<u>Multifamily</u>	
	Units	Value (millions)	Units	Value (millions)
1970	166	\$ 3.2	34	\$ 0.8
1971	258	5.6	280	3.6
1972	487	11.1	333	3.4
1973	424	10.2	329	5.0
1974	419	9.8	211	2.8
1975	611	14.4	379	4.4
1976	725	16.1	545	7.2
1977	895	19.6	360	4.9
1978	823	19.5	630	9.3
1979	572	13.2	572	10.4

Table 4 provides a summary of selected economic indicators for Billings and Yellowstone County. All indicators show strong steady growth.

Summary

The 1979 population of the Billings Urban Area and Yellowstone County approximates 96,300 persons and 109,100 persons respectively. During the past decade population growth has been steady with an average annual growth rate of 2.8 percent of the Billings Urban Area or 2.5 percent for the county. Yellowstone County personal income increased considerably from 1970 to 1978, with per capita income exceeding the state average by 15.8 percent as of 1978.

Billings and Yellowstone County employment expanded by 48 percent from 1970 to 1979. The unemployment rate has been below the state average in recent years. Major contributors to the economic base of the Billings area include trade, services and government. The trade and service sectors accounted for two-thirds of the county's growth in employment between 1972 to 1979.

Billings is a regional focal point for wholesale and retail trade. Yellowstone County accounted for one-third of the 1977 Montana wholesale sales volume and 18 percent of the state's retail trade. Service establishments located in Yellowstone County accounted for one-quarter of the 1977 Montana receipts. Manufacturing, agriculture and transportation also serve regional markets from the Billings area.

TABLE 4. SELECTED ECONOMIC INDICATORS FOR BILLINGS AND YELLOWSTONE COUNTY, 1970 THROUGH 1979

Economic Indicator	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
<u>Billings Urban Area</u>										
Electric Meters*										
Residential	22,999	23,917	24,929	25,701	26,513	27,457	28,117	29,024	30,185	30,519
Commercial	2,860	2,964	3,055	3,155	3,210	3,327	3,463	3,626	3,763	3,872
Telephone Main Stations**										
Resident	22,800	23,793	24,785	26,087	27,217	28,791	30,108	31,581	32,751	33,572
Business	4,276	4,523	4,766	5,149	5,434	5,969	6,446	6,998	7,544	7,739
Building Permits										
Number***										
Residential	191	290	535	480	477	671	827	996	907	629
Commercial	23	22	53	71	47	115	120	118	126	132
Bank Deposits (millions)****										
Yellowstone County	NA	NA	\$301.9	\$360.4	\$394.7	\$438.4	\$479.2	\$513.5	\$ 590.6	\$ 628.8
Billings	NA	NA	285.1	339.8	372.8	412.2	449.0	479.2	552.4	586.2
Savings and Loan Deposits (millions) ⁵										
Yellowstone County	\$ 48.2	\$ 56.2	\$ 66.1	\$ 79.0	\$ 91.1	\$103.1	\$129.4	\$147.4	\$ 167.3	\$ 191.0
Billings	48.2	56.2	66.1	79.0	91.1	101.7	126.4	143.1	160.7	182.4
Assessed Valuation (millions) ⁶										
Yellowstone County	\$375.3	\$384.1	\$404.5	\$436.5	\$459.2	\$523.2	\$575.7	\$611.2	\$1,900.5	\$1,961.2
Billings	212.2	216.1	228.0	256.6	269.0	307.8	336.2	347.2	1,088.2	1,111.6

*Jim Kaufman, Division Manager of Consumer Services, Montana Power, Billings, April 1, 1980 (year-end data).

**Linda Swanson, Technical Assistant, Mountain Bell, Helena, April 4, 1980 (year-end data).

***City of Billings, Building Department, Summary of Building Permits, 1970 through 1979 (year-end data).

****American Bank Directory, Fall Issue, 1972 through 1979; deposit data are for June.

⁵Federal Home Loan Bank Board, Washington, D.C., Branch Office Survey Docket Point, March 31, various years.

⁶Montana Department of Revenue, Report of the State Department of Revenue, various issues; Yellowstone County Assessors Office, Billings, April 1980. Starting in 1978, assessed valuation was changed to a market value approach which accounts for the large increase in values from 1977 to 1978.

Economic indicators including building permits, utility connections, assessed valuation, and bank and savings loan deposits confirm growth patterns in the Billings area.

In sum, Billings has experienced steady economic expansion since 1970. It has a well developed commercial and industrial base that serves a market or geographic area extending well beyond the Billings Urban Area.

SECTION II. AREA COAL DEVELOPMENT AND ITS RELATIONSHIP TO BILLINGS

This section identifies past and future coal development trends in Montana and those areas of northern Wyoming which are in the Billings primary service area. This area includes 10 Montana counties and three counties in Wyoming. In addition, the commercial nature of the relationship of regional coal development to Billings is examined.

Coal Production Trends, 1970 Through 1979

Figure 2 shows the location of major existing coal developments within the Billings service area.(21) Montana counties outside the Billings service area represent a modest amount of coal production at the present time and have less meaningful economic ties with Billings. In Wyoming, Campbell County coal production is substantial and expanding, but commercial ties of Campbell County coal companies or residents do not demonstrate an important relationship to Billings. As a result, this county is excluded from the service area definition.

Historical coal development. Table 5 provides annual Montana and Billings service area coal production for 1970 through 1979. Montana coal production has grown from 1.3 million tons in 1970, to 32.5 million tons in 1979. The growth trends are characterized by fluctuations in certain years coinciding with the production schedules of the State's three largest coal mines. Almost all of Montana's coal production between 1970 and 1979 occurs within the Billings service area. Wyoming's portion of the Billings service area coal production is small; since 1973, Wyoming has accounted for less than 10 percent of annual service area coal production.

Service area coal production exceeded 35 million tons in 1979, up from over 14 million tons in 1974. An average annual increase of 3.6 million tons in service area coal production is evident from 1970 through 1979; historical production rates indicate irregular growth patterns.

Montana coal employment. Past coal employment by Montana county is provided in Table 6. Almost all of the state's coal mining employment in recent years has been in Big Horn or Rosebud Counties. Based upon SIC code data provided by the Montana Employment Security Commission, employment in this industry has grown from 97 persons in 1970, to 1,274 persons by 1979. The bulk of the growth occurred between 1974 and 1978.

The employment data from this state agency are not precisely comparable with the employment figures offered by the individual mining companies. This is primarily attributable to classification differences (i.e., mining contractors might be classified in construction) or commuting pattern adjustments. The Montana Employment Security Commission data are applied because they provide a consistent base for analyzing other economic sectors which are linked to regional coal development.

Table 7 presents selected historical data about each service area coal mine. The Decker Mines and Rosebud Strip No. 6 are the two largest coal producers in the Billings service area. Together, these two operations will account

FIGURE 2. MAJOR OPERATING COAL MINES IN THE STATE OF MONTANA AND WITHIN THE BILLINGS SERVICE AREA

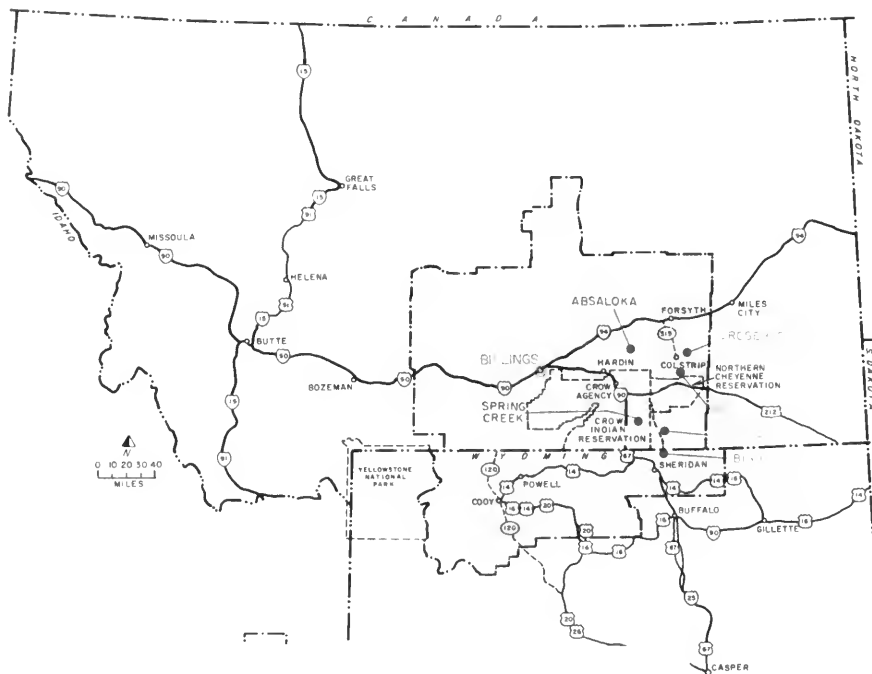


TABLE 5. RECENT COAL PRODUCTION TRENDS
IN THE BILLINGS SERVICE AREA

Year	Coal Production (millions of tons)			
	State of Montana	Billings Service Area		Total
		Montana	Wyoming	
1970	1.3	1.0	1.5	2.5
1971	7.4	7.0	1.8	8.8
1972	7.9	7.6	1.0	8.6
1973	10.4	10.1	0.5	10.6
1974	13.6	13.2	1.0	14.2
1975	22.0	21.8	0.8	22.6
1976	26.2	25.9	0.7	26.6
1977	27.3	27.1	2.4	29.5
1978	26.7	26.4	2.9	29.3
1979	32.5	32.1	3.0	35.1

Source: Selected publications from the Montana Coal Council, the Montana Department of Community Affairs and The Minerals Division of the Wyoming Department of Economic Planning and Development.

TABLE 6. MONTANA COAL MINING EMPLOYMENT BY COUNTY, 1970 TO 1979

COUNTY	Annual Average									
	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979*
Big Horn	7	72	68	109	183	258	334	445	772	865
Carbon	1	-	-	-	-	-	-	1	7	2
Missoula	-	-	-	-	8	11	2	3	6	6
Mussel Shell	20	15	11	5	3	3	3	5	4	5
Powder River	1	1	1	1	1	1	3	3	4	3
Richland	16	18	18	21	22	24	26	26	27	29
Roosevelt	-	-	-	-	3	5	1	-	-	-
Rosebud	52	56	76	242	254	361	383	391	421	364
TOTAL	97	162	174	378	474	663	752	874	1,241	1,274

Source: Montana Employment Security Division unpublished employment data by three and four digit SIC code.

*For this and subsequent 1979 employment figures from the Montana Employment Security Division, represent an average of the first six months of 1979.

TABLE 7. SELECTED HISTORICAL DATA ABOUT COAL OPERATIONS IN THE BILLINGS SERVICE AREA

Name of Mine	Developer	County Location	Coal Production (millions of tons)				Production Work Force (number of employees)			
			1977	1978	1979	1980 (est.)	1977	1978	1979	1980 (est.)
Montana:										
Absaloka	Westmoreland Resources	Big Horn	4.5	4.5	4.9	4.9	150	150	170	190
Big Sky	Peabody Coal	Rosebud	2.3	2.1	2.5	3.0	86	88	94	100
Decker Mines (East & West pits)	Decker Coal	Big Horn	10.4	9.2	13.0	14.0	378	515	580	640
Rosebud Strip No. 6	Western Energy	Rosebud	9.8	10.6	11.7	11.7	280	280	330	330
Spring Creek	NERCO	Big Horn	--	--	--	.4	--	--	--	110
Other Mines (P.M. and Coal Creek)	P.M. Coal and Coal Creek Mining	Musselshell	*	*	*	*	6	6	6	6
Subtotal			27.0	26.4	32.1	34.0	900	1,039	1,180	1,376
Wyoming:										
Big Horn	Peter Kiewit	Sheridan	2.4	2.9	3.0	4.0	132	180	180	180
TOTALS			29.4	29.3	35.1	38.0	1,032	1,219	1,360	1,556

*These two mines together produced between 25,000 tons and 41,000 tons between 1977 and 1979. Coal production totals include this tonnage.

Sources: The above data are from: selected publications from the Montana Coal Council and the Montana Department of Community Affairs; selected publications from the Minerals Division, Wyoming Department of Economic Planning and Development; selected environmental impact statements prepared by the Montana Department of State Lands; and interviews with mine officials associated with each company, April 1980.

for about two thirds of 1980 coal production and employment in the Billings service area. Further information and future plans for the existing service area coal developments are:(22)

- The Decker Coal Company began mining coal in 1972 from its Western Pit about 20 miles northeast of Sheridan, Wyoming. Production rapidly expanded, augmented by production from the Eastern Pit which, in 1980, will represent half of the 14.0 million tons of Decker Coal Company estimated production. This coal is shipped to steam generating plants in Illinois and Texas. As of May 1980, 640 persons were employed at the mine site; this represented 44 percent of Billings service area coal employment. Decker Coal Company has more than 400 million tons of coal reserves under lease in proximity to its existing operations. Although the existing facilities could accommodate an annual production rate of 17 million tons, current forecasts indicate a continuation of the 14 million tons per year rate through 1990.
- Western Energy Company, a subsidiary of Northwestern Resources and Montana Power Company, has producing coal properties one mile south of the Town of Colstrip. Commencing production in 1971, the Rosebud Strip No. 6 Mine is operated by Long Construction Company. The mine is expected to produce 11.7 million tons in 1980 with about 330 employees. The bulk of current production is shipped to utilities in the upper Midwest. Coal production from the Rosebud Mine is projected to increase to 19.8 million tons per year by 1987, and the additional production will be dedicated to electricity generation at Montana Power Company's Colstrip Units #3 and #4.
- The Absaloka Mine went into production during July 1974 and currently produces 4.9 million tons annually. Located in Big Horn County about 30 miles east of Hardin, this mine is the closest major coal production facility to Billings (approximately 70 miles). Morrison-Knudsen operates the mine, which is also known as Sarpy Creek, for Westmoreland Resources. The existing facilities and permits could accommodate production increases up to 10.5 million tons, but the current market, mostly midwestern utilities, will not support this production rate. Based on improving market conditions in the mid-1980's, 10 million tons are projected by 1988.
- Peabody Coal Company operates the Big Sky Mine five miles south of Colstrip. Coal production began in 1969, and should peak in 1981 at 4.2 million tons to meet contract commitments. As of May 1980, 100 persons were employed at the mine site with 112 employees expected by 1981.
- The Big Horn Mine, owned and operated by Peter Kiewit and Sons, Incorporated, is situated in Sheridan County about

eight miles from the City of Sheridan. According to the mine manager, Big Horn will produce about four million tons in 1980 but resume a three million ton per year annual rate through 1990. Employment at the mine site should remain at recent levels of about 180 persons.

- Northern Energy Resources Company (NERCO), a subsidiary of Pacific Power and Light Company, plans to complete construction in 1980 at its Spring Creek Mine eight miles northwest of Decker, Montana. About 500 construction workers are currently on site. Production is forecast to increase from 400,000 tons in 1980, to 7.0 million tons by 1983. Houston Power and Light is the customer for the Spring Creek Mine.

Future coal development. Besides the expansion of existing mines, other coal properties are likely to be developed within the Billings service area between 1980 and 1990. The likelihood or development schedules of each of these mines will be influenced by a number of considerations:

- (1) Absorption of present capacity at existing area mines
- (2) Development schedules of steam electric generating plants in part determined by electricity consumption growth rates
- (3) Prospects for synthetic fuels development and Federal Government support of this effort
- (4) Adjustment to the current Montana severance tax rate
- (5) Government regulations and permit procedures

The existing market for Northern Powder River Basin coal has been depressed by lower than expected growth in electricity demand and competitive influences. As available generating capacity is absorbed, power plant expansions will be initiated. Major increments to electricity generating capacity can be anticipated between 1985 and 1990. Further, export markets, such as Japan, are a possibility. Southern Montana coal reserves are ample and of relatively high quality. Unless permitting procedures or pending litigation causes unexpected delays, regional coal demand is forecast to improve during the late 1980's.

Synthetic fuels development, the conversion of coal to natural gas or methanol, is a major unknown. As the first step in a comprehensive federal support program, the U.S. Department of Energy will provide funds for detailed feasibility studies for a number of proposed synthetic fuel developments. Within the Billings service area, the Crow Tribe has been awarded a \$2.7 million Department of Energy grant to study the feasibility of a synthetic fuel plant.(23) A very small gasification plant is under active consideration immediately south of the City of Billings; this plant will have only a modest effect on coal demands because of its limited size.

The uncertainties surrounding synfuels development presently offsets its favorable prospects. Economic feasibility does not presently favor private investment. Federal energy policy firmly backing synthetic fuels development has yet to be established and has been slow to formulate. Political pressures

add another uncertainty. Because of the economic links between Crow Agency and the Billings area, a major synthetic fuel complex on the reservation would impact the Billings area if it became a reality. Although prospects for synfuels have improved, insufficient knowledge is present to forecast development for the Billings service area.

Table 8 provides selected data about planned coal developments. Those projects which have strong market prospects or which are in a favorable position to take advantage of improving coal market conditions are included in the coal production forecast.

Table 9 presents coal production and employment forecasts within the Billings service area. These projections are comprised of existing and expanding coal operations as well as new mines.

Figure 3 depicts coal production trends from 1970 to 1990. Between 1970 and 1979, production grew from 2.5 million tons to 35.1 million tons. Projections indicate that production will expand by about 50 million tons in the coming decade. Coal production in the Billings service area is projected to reach 86.6 million tons by 1990, with most of the production coming from within Montana. Production growth is expected to be gradual in the early 1980's, but more rapid during the 1984 through 1988 period.

Coal employment within the Billings service area is projected to more than double between 1980 and 1990, reaching 3,340 production workers by the latter year. The bulk of the almost 1,800 employment increase will occur after 1984.

The Commercial Relationship of Regional Coal Development in the Billings Area

The economic relationship of regional coal development to Billings is comprised of two major elements: direct expenditures by the mining company or its contractors and the residential or commercial relationships of the mine related employees. Both of these major categories are made up of a number of sub-elements which together describe the nature of coal development impacts on the Billings area.

The data and insights provided below are drawn from interviews with coal developers and their contractors, local planners and a number of merchants in towns throughout southern Montana. These personal interviews were conducted in April 1980.

Company and contractor expenditures. Coal mining companies, along with their construction and mining contractors, purchase goods and services to build and operate their coal mines. The patterns of these purchases differ between the construction and production phases of the operation.

The existing mines within the Billings service area purchased only a modest portion of the required goods and services for the construction phase in the Billings area. Almost all of the construction equipment and major components of the coal production facility are so specialized that the construction contractor must acquire these items elsewhere in the U.S. The pattern of non-local purchases is accentuated by the high proportion of out-of-state construction contractors and subcontractors, and an extensive bidding process. Even so, a

TABLE 8. PLANNED NEW COAL DEVELOPMENTS IN MONTANA AND SHERIDAN COUNTY, WYOMING

Name of Mine	Developer	Location	Year of Production Commencement	Year of Production Peak	Maximum Production (millions of tons)	Peak Operational Work Force (employees)	Comments
Montana:							
Nance	MONTCO	Powder River	1986	1989	12.0	450	Permitting initiated: needs a market
Pearl	Shell	Rosebud	1990	1991	2.0	140	Permits submitted; no market yet; Youngs Creek more marketable
Youngs Creek	Shell	Big Horn	1985	1987	8.0	400	Agreement with Crow Indians established; Portions of reserves sold
Wyoming:							
Cx	Peter Kiewit and Sons, Inc.	Sheridan	1985	1987	4.0	130	Detailed project planning underway; market likely
Welch	Sheridan Enterprises	Sheridan	1984	1989	3.5	200	Fully permitted; construction could begin six months after coal is contracted

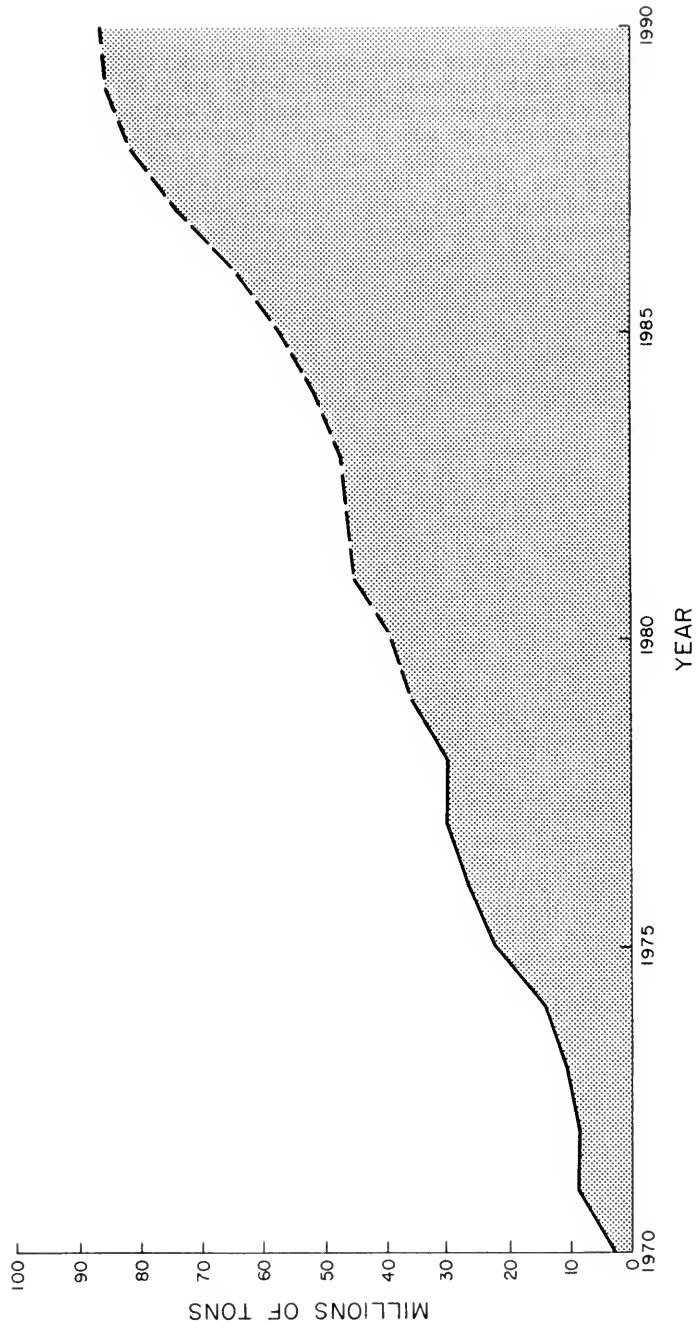
Sources: The data pertaining to each mine are based on interviews with company officials and an evaluation of their market potential, May 1980.

TABLE 9. COAL PRODUCTION AND EMPLOYMENT FORECASTS
WITHIN THE BILLINGS SERVICE AREA THROUGH 1990

Year	Montana Service Area		Total Service Area	
	Coal Production (Millions of tons)	Operational Employment	Coal Production (millions of tons)	Operational Employment
1980	34.0	1,370	38.0	1,550
1981	41.9	1,510	44.9	1,690
1982	43.4	1,550	46.4	1,730
1983	44.6	1,610	47.6	1,810
1984	48.6	1,740	52.2	2,020
1985	51.7	1,920	57.2	2,280
1986	56.6	2,170	64.1	2,570
1987	65.0	2,430	73.5	2,870
1988	72.0	2,610	82.0	3,100
1989	75.0	2,770	85.5	3,280
1990	76.1	2,830	86.6	3,340

Sources: The above coal production and employment projections are based largely on personal interviews with local coal developers, April and May 1980. Secondary sources were also reviewed, including: U.S. Department of Energy, "A Survey of Coal Mining Capacity in the West," Western Coal Development Monitoring System, January 1980; Coal Age, February 1980, pp. 102-112; and various environmental impact statements for special projects, 1978 to 1980.

FIGURE 3. COAL PRODUCTION WITHIN THE BILLINGS SERVICE AREA 1970 TO 1990



Source : See Table 9.

portion of the mine construction expenditures do occur in the Billings area. Day-to-day items, such as tools, steel, bolts and similar items are often purchased in the Billings area. In certain instances, the site preparation and foundation were contracted out of the Billings area. Certain electrical and plumbing contracting have also been performed by Billings companies. Although the Billings capture rate for the initial capital investment for coal facilities is modest, the absolute dollar figures are noteworthy. It is estimated that as much as 10 percent of the initial capital investment for a coal mine in the service area is comprised of Billings purchases. Initial capital investment for service area coal mines approximate \$600,000 for every million tons of production capacity. Hence, \$60,000 of Billings area purchases were evident for each million tons of coal production capacity installed within the Billings service area. Based upon this ratio and the existing total capacity in the Billings service area, an estimated \$1.5 million to \$3 million of Billings expenditures resulted from the construction of service area coal facilities.

As a mine goes into coal production, different purchase patterns prevail. Certain categories of expenditures are typically made in the Billings area while others are almost always made outside the region. The largest and most expensive forms of equipment, draglines or coal shovels, are bought directly from the manufacturer in such locations as Wisconsin or Ohio. Equipment such as scrapers, dozers, graders or frontend loaders are generally purchased in the Billings area. Equipment parts, service or related supplies are also purchased out of Billings. It is estimated that between \$200,000 and \$400,000 in Billings expenditures occur for each million tons of coal production within the Billings service area. Therefore, between \$7.6 and \$15.2 million in Billings expenditures will be directly attributable to operating coal company purchases in 1980. Gillette, Wyoming area coal mines, based upon Billings interviews and mine purchasing records, represent a limited portion of these expenditures.

Commercial relationships of coal related employees. The commercial relationships of coal related employees to the Billings area are a function of their residence and shopping patterns.

A very small number of permanent coal mining employees live in the Billings area. The operational employees who work at the Southern Big Horn County Mine or in Sheridan County primarily live in or near the City of Sheridan, Wyoming. The mine employees who work in the Colstrip area of Rosebud County tend to live in Colstrip or Forsythe. The Sarpy Creek Mine employees live in or around Crow Agency or Hardin.

The shopping patterns of these mine employees indicate an important commercial relationship to the Billings area. Depending on the proximity of the mine to Billings, employees or their family members will shop in the Billings area from two or three times a year up to twice a month. Convenience goods items are usually bought in close proximity to the miners place of residence. Comparative goods are purchased in Billings or one of the larger communities in the area. These shopping patterns are highly variable; the development of the shopping center in Colstrip and the Rimrock Mall had an influence on area shopping patterns. In addition, certain service functions, such as hospital care, are often obtained in Billings (see Appendix B).

Beyond the direct purchases or expenditures of mine related employees in the Billings area certain indirect commercial relationships are evident. The

economic bases of a number of communities in southern Montana are heavily dependent on coal development. As such, the residents and businesses in these respective towns are dependent on coal development. These residents and local businesses (through wholesale purchases) also contribute to the Billings area economy.

Temporary construction employees of area coal mines also exert a commercial influence on the City of Billings. Many of the mine construction projects in the Billings service area have been performed by union contractors which use personnel from Billings union halls. As a result, a sizable proportion of the construction work forces have traditionally been work week commuters, living near the site during the week and commuting back to Billings for weekends.

In sum, future coal development will be substantial in the Billings primary service area. This situation will continue to cause economic impacts upon Billings.

SECTION III. IMPACTS OF REGIONAL COAL DEVELOPMENT

The purpose of this section is to identify and evaluate the historical economic and demographic impacts of regional coal development on the Billings Urban Area. The technique applied in determining these impacts is an analysis of basic employment, both direct and indirect, attributable to regional coal development.

Three types of employment attributable to regional coal development within the basic employment sectors of the economy are considered:

- Coal firm employment--direct impact
- Coal related industry employment--secondary impact
- Indirect employment growth--indirect impact

The aggregate of the three types of coal related basic employment identifies Billings Urban Area basic employment attributable to regional coal development. Utilizing basic employment growth related to regional coal development, induced or local service employment associated with regional coal development is determined. Total coal related employment is applied toward measuring the present and historical population effects that regional coal development has had upon the Billings Urban Area.

Billings Coal Firms

Employment within coal firms or coal producing companies in the Billings area represents a direct economic impact attributable to regional coal development. In 1979, there were five coal firms with offices located in Billings. These companies and their 1979 average employment, based upon individual interviews, related to coal development include:

Name of Firm	Coal Employees
Montco	10
Northern Resources	11
WESCO	8
Western Energy	21
Westmoreland	7
Total	57

The Montana Employment Security Division reported that there were three coal companies employing 20 coal employees within Billings in 1979. The difference between the Employment Security Division data and the actual number of coal firms and coal employees within the Billings SMSA is attributable to SIC code classification differences. In the following analysis, Montana Employment Security Division data will be utilized for the consistency purposes in determining historical employment impact related to regional coal development on the Billings Urban Area.

Coal employment from 1972 through 1979 for Billings and Yellowstone County is:(24)

Year	Coal Employment	
	Yellowstone County	Billings Urban Area
1972	11	9
1973	15	12
1974	25	20
1975	10	8
1976	3	2
1977	1	1
1978	10	8
1979	21	17

Coal employees residing in the Billings Urban Area have been minimal over the past seven years. Coal employees residing in this area are primarily involved with administrative functions.

Economic impacts attributable to direct coal company employment growth upon Billings have been small. Coal development impacts upon the Billings area are largely through economic linkages with coal operations located outside the community.

Billings Coal Related Industries(25)

Industries within the Billings economy which sell their products or services directly to a coal company are viewed as having direct economic linkage with the development or servicing of the coal industry. The identification of Billings industries which have this linkage with the coal industry provides a means to measure indirect economic impacts traced to coal development on the Billings Urban Area. A portion of basic employment identified as coal related is ascertained within each coal related industry. This approach develops an indication about the indirect economic impact as a result of coal development. Personal interviews (see Appendix A) provide the basis for a substantial part of the following analysis.

Fourteen industry groups have a meaningful economic linkage with the regional coal development. The industries cover a wide variety of services and products including:

- Rail transportation
- Air transportation
- Fabrication of structural and metal products
- Prefabrication of wood buildings and components
- Wholesale trade of heavy machinery, equipment and supplies
- Metal service center--wholesale trade
- Wholesale trade of motor vehicle and automotive parts
- Wholesale trade of electrical apparatus equipment, wiring supplies and construction material
- Petroleum refining
- Welding repair and rewinding services
- Heavy construction and general building contractors

- Equipment rental and leasing
- Engineering, architectural and surveying services
- Land, mineral, wildlife and forest conservation, and research and development

The eight sectors with the largest coal related impacts are considered below.

Fabricated structural metal products (manufacturing). Billings' firms in this industrial classification are involved with, for example, the manufacturing of structural metal for buildings, fabricated plate work for storage tanks or sheet metal work. There are presently nine organizations in the Billings SMSA engaged in this form of metal manufacturing. They employed approximately 330 people in 1979. Over two-thirds of Montana's employment in fabricated structural metal products is located in the Billings SMSA.(26)

Billings based firms involved in the fabrication of structural metal products conduct only 15 percent of their business inside Yellowstone County. The largest portions of their business cover the entire state of Montana (43 percent) and other northwestern states (42 percent).(27)

Two Billings companies classified in this industry group which conduct substantial business with the coal industry are the Rosco Steel Company and Empire Steel Manufacturing Company. Empire Steel manufactures fuel storage tanks while Rosco Steel produces a variety of steel fabricated products for individual coal companies. On the average, 13 percent of this industry group's business (sales revenue) is conducted with coal companies.

Table 10 presents employment growth for Billings and Yellowstone County coal related industries for 1972 through 1979. During the past seven years, Billings Urban Area employment in the fabrication of structural metal products industry group increased 43 percent. Approximately 14 percent of Billings Urban Area employment in fabricated structural metal products was determined to be directly attributable to regional coal development in 1979.

Table 11 presents Billings and Yellowstone County coal related industry 1979 employment directly related to regional coal development. Relationships were determined through interviews with approximately 80 percent of local coal related employers to ascertain the percentage of their business volume which was conducted with coal companies in 1979. A weighted average percentage was derived for each coal related industry group which was applied to industry group employment to determine coal related employment.

Figure 4 illustrates Billings Urban Area employment growth in coal related industries directly attributable to regional coal development. From 1972 to 1979, about two-fifths of the Billings Urban Area employment growth experienced in fabricated structural metal products was directly associated with regional coal development. Impacts upon this industry group as a result of further regional coal development will continue.

Machinery, equipment and supply (wholesale trade). In 1979 there were approximately 135 firms employing an estimated 1,500 workers in the industrial classification of machinery, equipment and supplies--wholesale trade. Billings coal-linked firms classified in this industrial group are primarily engaged in the sale and distribution of construction and mining machinery equipment; indus-

TABLE 10. ANNUAL AVERAGE BILLINGS AND YELLOWSTONE COUNTY EMPLOYMENT IN COAL RELATED INDUSTRIES FOR 1972 THROUGH 1979*

SIC Code	Industry group By Three or Four Digit SIC	1972			1973			1974			1975			1976			1977			1978			1979		
		Yellowstone County	Billings Urban Area	Yellowstone County	Billings Urban Area	Yellowstone County	Billings Urban Area	Yellowstone County	Billings Urban Area	Yellowstone County	Billings Urban Area	Yellowstone County	Billings Urban Area	Yellowstone County	Billings Urban Area	Yellowstone County	Billings Urban Area	Yellowstone County	Billings Urban Area	Yellowstone County	Billings Urban Area	Yellowstone County	Billings Urban Area		
2452	Prefabricated wood Buildings & Components (Manufacturing)	--	--	--	--	--	--	--	--	--	20	10	17	8	189	90	300	190	379	205					
154, 1622	Heavy Construction and General Building Contractors (Construction)	541	487	334	301	360	324	452	407	452	407	356	320	477	429	477	429	477	429	477	429				
1623, 1629		923	831	930	837	876	788	742	668	786	707	869	782	850	765	797	717	850	765	797	717				
291	Petroleum Refining (Manufacturing)																								
401	Railroad Transportation (Transportation and communications and public utilities)	1,129	745	1,245	822	1,259	831	1,284	847	1,307	863	1,245	822	1,433	946	1,490	943	1,433	946	1,490	943				
344	Fabricated Structural Metal Products (Manufacturing)	230	207	265	239	255	230	246	221	271	244	289	260	303	273	330	247	303	273	330	247				
451	Air Transportation, Certified Carriers (Transportation, communications and public utilities)	57	52	73	66	78	70	63	57	52	47	89	80	124	112	165	149	124	112	165	149				
505	Metal Service Centers and Offices (Wholesale trade)	92	83	92	83	92	83	46	41	54	49	65	59	67	60	68	61	67	60	68	61				
5063	Electrical Apparatus and Equipment, Wiring Supplies and Construction Material (Wholesale trade)	46	41	47	42	49	44	61	55	72	65	73	66	91	82	106	95	91	82	106	95				
508	Machinery, Equipment and Supplies (Wholesale trade)	863	777	933	840	1,016	914	998	898	1,182	1,064	1,310	1,179	1,421	1,279	1,486	1,337	1,421	1,279	1,486	1,337				
501	Motor Vehicles and Automotive Parts and Supplies (Wholesale trade)	449	404	489	440	483	434	440	396	502	452	536	482	549	494	615	554	549	494	615	554				
7692 & 7694	Welding Repair and Armature Rewinding Shops (Services)	55	50	48	43	49	44	66	59	72	65	82	74	85	77	90	81	85	77	90	81				
7394	Equipment Rental and Leasing Services (Services)	25	23	26	23	30	27	29	26	29	26	28	25	31	28	38	34	31	28	38	34				
891	Engineering, Architectural and Surveying Services (Services)	282	254	309	278	355	320	351	316	381	343	421	379	505	455	505	455	505	455	505	455				
7391 & 9521	Land, Mineral, Wildlife and Forest Conservation, Research and Development (Government)	202	182	208	187	244	220	305	275	320	288	350	315	298	268	361	325	298	268	361	325				
	Total Resident Employment	4,894	4,136	4,999	4,201	5,146	4,329	5,103	4,276	5,497	4,628	5,902	4,933	6,534	5,458	6,857	5,722	6,534	5,458	6,857	5,722				

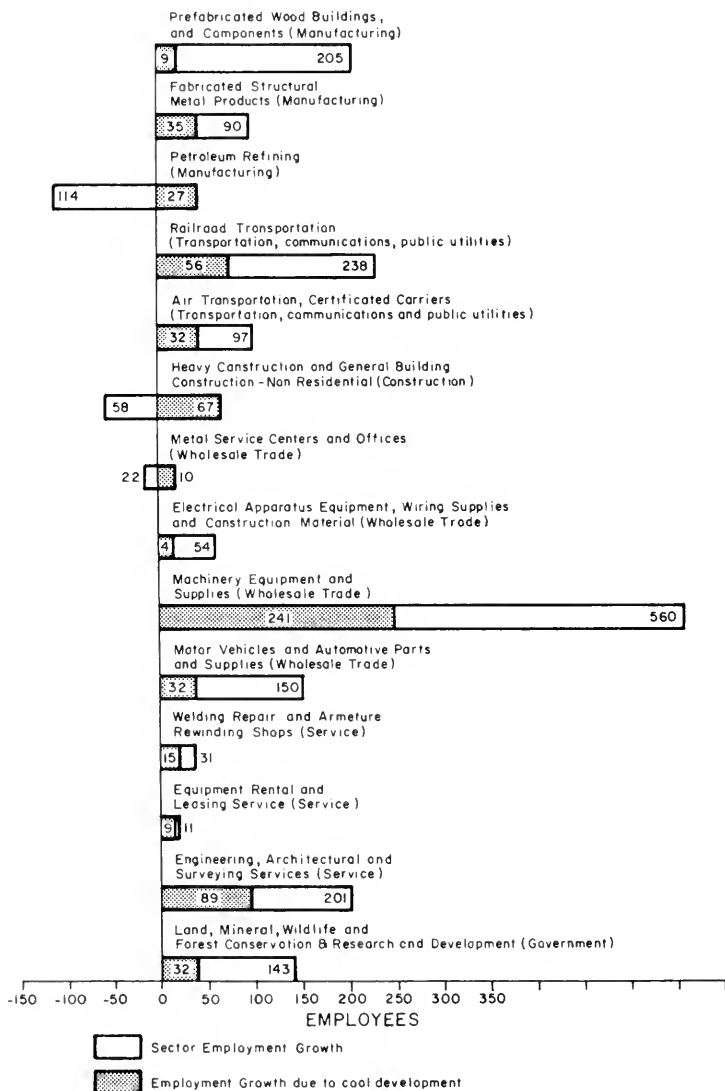
*The employment figures are from the Montana Employment Security Division; unpublished 1972 through 1979 employment data by three and four digit SIC code. Certain industry groups are combined because undisclosed sure laws and similarly in activity performed among industry groups.

TABLE 11. BILLINGS AND YELLOWSTONE COUNTY 1979 COAL RELATED INDUSTRY EMPLOYMENT RELATED TO COAL DEVELOPMENT

SIC Code	Industry Group (One Digit Classification)	Yellowstone County		Billings Urban Area		Percentage of Total Uirect Linkage Industry Employment Attributable to Coal in Bil- lings Urban Area
		Total Employment	Coal Related Employment	Total Employment	Coal Related Employment	
2452	Prefabricated Wood Buildings & Components (Manufacturing)	329	19	205	12	6%
1514, 1622, 1623, 1629	Heavy Construction and General Building Contractors--non-residential (Construction)	477	91	429	82	19
291	Petroleum Refining (Manufacturing)	797	36	717	32	5
401	Railroad Transportation (Transportation, communication and public utilities)	1,490	136	983	68	7
344	Fabricated Structural Metal Products (Manufacturing)	330	47	297	42	14
451	Air Transportation, Certificated Carriers (Transportation, communication and public utilities)	165	43	149	39	26
505	Metal Service Centers and Offices (Trade--wholesale)	68	13	61	12	20
5063	Electrical Apparatus Equipment, Wiring Supplies and Construction Material (Trade--wholesale)	106	5	95	5	5
508	Machinery, Equipment and Supplies (Trade--wholesale)	1,486	327	1,337	294	22
501	Motor Vehicles and Automotive Parts and Supplies (Trade--wholesale)	615	43	554	39	7
7692 & 7694	Welding Repair and Armature Rewinding Shops (Services)	90	21	81	19	24
7394	Equipment Rental and Leasing Services (Services)	38	12	34	11	32
891	Engineering, Architectural and Surveying Services (Services)	505	120	455	108	24
9521 & 7391	Land, Mineral, Wildlife and Forest Conservation, Research and Development (Government)	361	44	325	40	12
Total		6,857	957	5,722	803	14%

Source: Montana Employment Security Division, unpublished 1972 through 1979 employment data by three and four digit SIC code and interviews with employers in coal related industries. The determination of industry group employment directly attributable to regional coal development is based upon the percentage of business (sales revenue) that a firm had directly with a coal company or coal related firm. See Appendix A for a detailed breakdown of percentage of coal related business conducted within coal linked industry groups. The allocation of Billings Urban Area employment is based upon the same methodology applied in Table 2.

FIGURE 4. BILLINGS URBAN AREA EMPLOYMENT GROWTH IN COAL RELATED INDUSTRIES DIRECTLY ATTRIBUTABLE TO COAL DEVELOPMENT FROM 1972 TO 1979*



* Employment growth of coal related industries is calculated from Table 10. The growth of employment attributable to coal development within these industries is calculated from the identified 1979 coal related employees, Table 11.

trial tools; heavy machinery and equipment; industrial supplies such as bearings, fittings valves and power transmission equipment.

The majority of this industry group's business is conducted outside Yellowstone County (77 percent), covering Montana, Wyoming, North Dakota and South Dakota. The Billings SMSA accounts for 30 percent of the state's employment classified in machinery, equipment and supplies--wholesale trade. In comparison, the Great Falls SMSA has approximately 13 percent of the state's employment in this industry group.

Tractor and Equipment Company, Crown Parts Company, Holeman G.M. Diesel Inc., Cummins XL, Inc., and Tri-State Equipment Inc. are certain of the larger Billings SMSA firms within this industry group that conduct a large amount of coal related business. Almost one-quarter of this industry group's business volume is conducted with coal companies.

Billings Urban Area employment classified under machinery equipment and supplies--wholesale trade has grown by 560 employees, or a 72 percent increase since 1972. In 1979, an estimated 300 employees or 22 percent of Billings Urban Area employment in this industry group was directly attributable to regional coal development. This industry group accounts for over one-third of the total direct coal related industry employment associated with regional coal development. An estimated 43 percent of the 1972 to 1979 Billings Urban Area employment growth in machinery equipment and supplies--wholesale trade is directly a result of regional coal development.

Over three-quarters of the firms interviewed in this industrial group stated that increased sales will result from continued regional coal development. With increased regional coal activity, many of these firms could experience substantial growth.

Engineering, architectural and surveying services (services). There are an estimated 48 engineering, architectural and surveying firms in the Billings SMSA. They employ approximately 500 people. These organizations provide a number of services such as industrial, civil, electrical mechanical and design engineering; land, water and aerial surveying; and architectural services.

Geographically, three-tenths of this industry group's business is conducted in Yellowstone County, or two-thirds in Montana and the balance out-of-state. The bulk of Billings-based engineering, architectural and surveying firms consider the entire northwest United States to be their market. About 40 percent of Montana employment classified under engineering, architectural and surveying services is located in the Billings SMSA.

Major Billings companies classified in this industry group which conduct a measurable amount of business with the coal companies include Wirth & Associates, Inc., Christian-Spring-Sielback & Associates, and Northern Testing Laboratories, Inc. The industry group as a whole had one-fifth of their business with coal companies.

Almost one-quarter of Billings Urban Area 1979 employment in this industrial group was determined to be tied to regional coal development. From 1972 to 1979, a 79 percent increase in employment was experienced in the engineering, architectural and surveying services sector--over two-fifths of this increase can be accounted for by regional coal development.

The future potential for noteworthy growth to take place within this industry group as a result of continued coal development is strong. Recently, the coal companies operating in Montana have begun to acquire more of these types of services from Billings' firms instead of dealing with more distant competitors. Several civil engineering firms which were interviewed expressed that they have begun to develop work with the coal companies and have expectations that future coal work will comprise a greater proportion of their work load.

Welding repair and armature rewinding shops (services). There are currently 15 welding shops and four armature rewinding shops in the Billings SMSA. Nineteen firms employed 90 workers in 1979. This industry group provides a variety of repair service for the coal industry including machine welding repair, electric motor repair, rebuilding motors or rewinding starters.

Billings SMSA welding repair and armature rewinding shops generally serve southeastern Montana and northern Wyoming. About two-thirds of the industry group business is generated within Yellowstone County.

General Electric Service Company, Billings Machine and Welding Shop, and Frank's Welding and Machine are three of the major Billings-based firms within this industry group which conduct a portion of business with the regional coal companies. Based upon personal interviews with these and other firms within this industry group, five to 50 percent of their business is conducted directly with coal companies.

Almost one-quarter of the Billings Urban Area 1979 employment in this industry group is directly ascribed to regional coal development. Since 1977, five new welding and armature repair shops have been established in the Billings SMSA. Total employment of Billings Urban Area welding or armature repair shops has increased about two-thirds since 1972 with coal impact accounting for almost half of this growth.

Railroad transportation (transportation, communications and public utilities). There are 1,500 employees located in the Billings SMSA working for Burlington Northern Railroad. Eight hundred railroad employees are headquartered in Laurel with the balance in Billings.

A coal car preventive maintenance and repair shop went into operation in Laurel in 1977. Presently, 128 employees are directly involved in the transportation of coal in Laurel. An additional eight employees headquartered in Billings are also involved with coal. About half of these 136 coal related railroad employees reside in the Billings Urban Area.

Railroad employment in the Billings Urban Area has increased by 32 percent from 1972 to 1979. Approximately one-quarter of this growth is directly attributable to regional coal development.

Petroleum refining (manufacturing). Three petroleum refinery manufacturing plants, employing 800 people are located in the Billings SMSA. CONOCO and EXXON have their plants located in Billings while the CENEX plant is located near Laurel.

Based upon personal interviews, a large portion of the diesel and gasoline products consumed by the coal mines in southeastern Montana is a product of Billings refineries. Approximately five percent of the Billings Urban Area

employees in petroleum refining are directly related to regional coal development; this ratio equates to 32 employees.

Employment growth in the petroleum refining industry has been declining over the past seven years, decreasing from 830 employees in 1972 to 720 in 1979. Future increases in employment within this industry group are expected to be negligible.

Heavy construction and general building contractors--nonresidential (construction). Approximately 50 Billings SMSA firms fall into this industrial classification. They currently employ 477 workers. Heavy construction and general building contractors--nonresidential are engaged in several activities including construction of industrial buildings and warehouses; construction of commercial, institutional and recreational buildings; construction of bridges, tunnels and viaducts; and utility construction.

The primary geographic service area of this industrial group covers eastern Montana and the northern half of Wyoming. Almost three-quarters of their business is conducted outside Yellowstone County.

Ramsey Construction Company and Hansen-Kelly Construction, Inc. are two major construction firms within this industry group which conduct a sizable proportion of business with coal companies.

Employment in the area of construction has fluctuated over the past seven years. The current employment figure of 477 is down from the annual average of 540 employees in 1972. In 1979, almost one-fifth of the Billings Urban Area employment in heavy construction and general building contractors--nonresidential work was determined to be tied to regional coal development. Future growth in this industry which could be attributable to coal development will directly fluctuate with the construction of new coal mines in the surrounding area.

Land, mineral, wildlife and forest conservation & research and development (government). The Billings SMSA has 360 governmental workers, federal and state, employed in the land, mineral, wildlife and forest conservation, and research and development industry group. The governmental agencies within this group which are identified as having a direct linkage with the coal industry include the United States Geological Service, Montana Department of State Lands, and the Bureau of Land Management. The management and leasing of state and federal lands is one of the primary functions these agencies provide to coal operators. The State of Montana is the primary geographic service area for which these governmental agencies are responsible.

During the past seven years, this industry group expanded by approximately 160 employees. In 1979, about 40 Billings Urban Area employees in this industry group was traced to coal.

Based upon interviews conducted with selected governmental agencies, future employment changes will be minimal. The majority of employees whose responsibilities are coal related were hired between 1974 and 1977. The present staffing is viewed as adequate for future requirements in relation to regional coal development activities.

Summary. There are over 370 Billings SMSA firms employing 6,860 people in the 14 identified coal-linked industry groups. Approximately 5,700 of the 6,860 employees within these industries reside in the Billings Urban Area. Based upon personal interviews conducted with several firms, 800 employees, or 14 percent of these 5,700 Billings Urban Area employees, are coal related in 1979.

Figure 5 illustrates Billings Urban Area employment in coal related industries directly attributable to regional coal development for 1972 through 1979. Coal related industry employment expanded 38 percent during this seven year period. Employment traced to regional coal development increased almost six-fold during this same time period accounting for 42 percent of the growth experienced by the coal related industry group as a whole. Figure 6 shows Billings Urban Area basic employment growth due to coal related employment within coal linked industries. Basic employment in the Billings Urban Area increased by 5,870 employees from 1972 to 1979; approximately 11 percent of this growth is associated with coal related employment within coal linked industries. The basic employment sectors of agriculture; finance, insurance and real estate; and other have no coal related employment growth attributable to coal-linked industries.

Billings Growth Indirectly Stimulated by Regional Coal Development--Indirect Impact

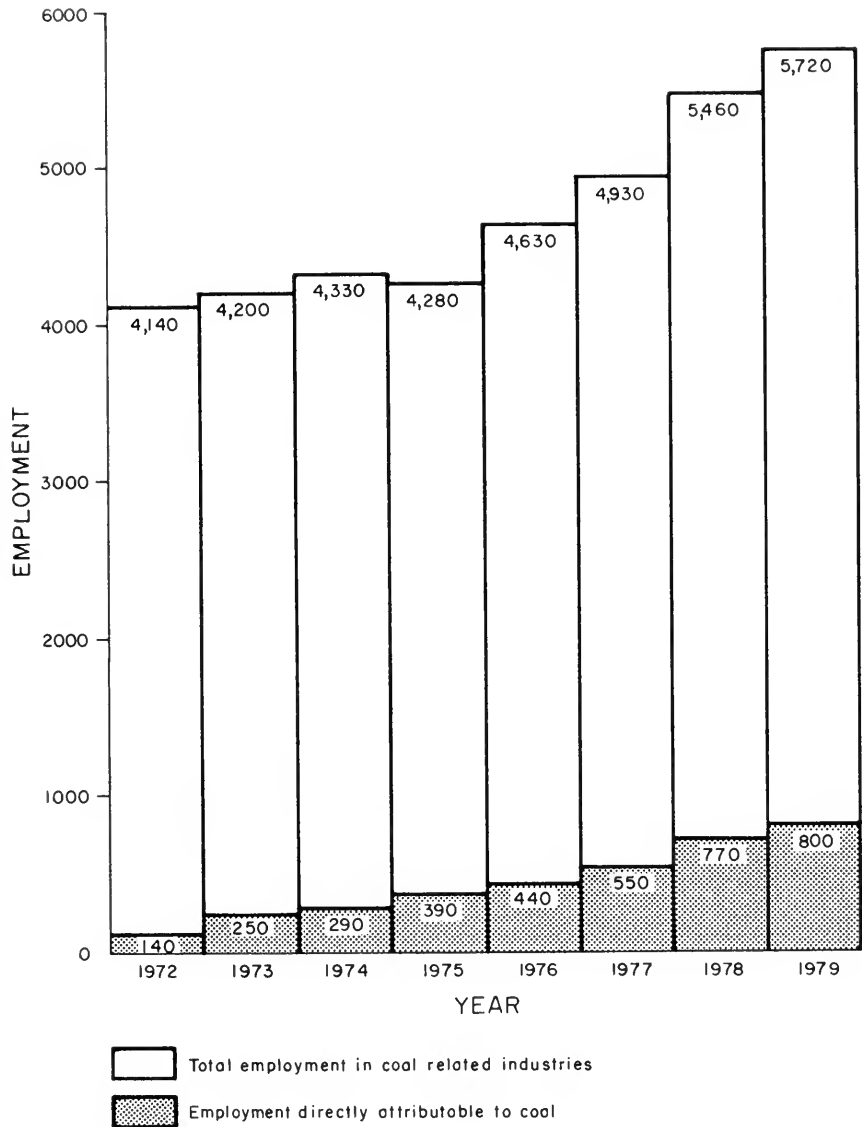
The measurement of the economic growth due to purchases of Billings' products and services by coal related employees, non-coal related employees and businesses located in coal development areas outside of Yellowstone County represents another consideration. Indirect impact has generated from a large flow of income into the Billings area and induced basic employment growth throughout the economy. Examples of the types of relationships which induce this economic coal related growth include:

- Coal related employees residing in coal development areas such as Colstrip who make retail purchases of products or services in the Billings area. An example of this relationship would include a coal employee or construction employee working in a coal mine who travels to Billings to purchase goods or services.
- Businesses in the areas of wholesale, retail, services or government located in coal development areas which purchase products or services from Billings-based firms. For instance, a school district which requires the services of an engineering consulting firm to design a new elementary school based upon coal induced demand.

Methodology. The methodology applied to measure the indirect coal related growth upon the Billings Urban Area is:

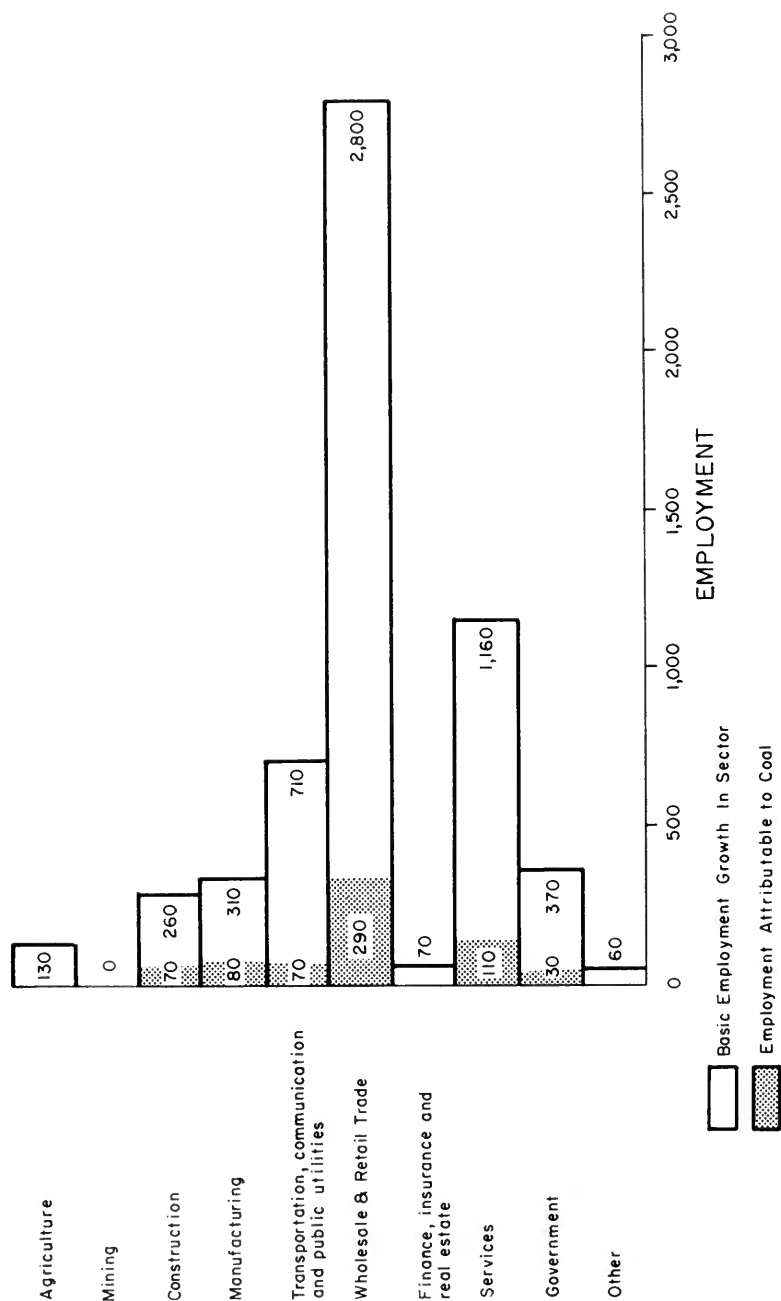
- The traditional basic employment definition applies. This is viewed as an "export" category; it is related to other than local economic activity.
- Billings service area is considered; for this analysis, it excludes Yellowstone County and includes 10 Montana counties and three counties within Wyoming (see Figure 1).

FIGURE 5. BILLINGS URBAN AREA EMPLOYMENT IN COAL RELATED INDUSTRIES, DIRECTLY ATTRIBUTABLE TO REGIONAL COAL DEVELOPMENT FROM 1972 THROUGH 1979*



*Billings urban area 1972 to 1979 coal related industry employment is from Table 10. The 1979 employment directly attributable to coal is in Table 11.

FIGURE 6: BILLINGS URBAN AREA BASIC EMPLOYMENT GROWTH ATTRIBUTABLE TO COAL RELATED EMPLOYMENT IN COAL LINKED INDUSTRIES FROM 1972 TO 1979



Note: Billings Urban Area basic employment growth is from Table 3. Coal related employment growth within coal linked industries is shown in Figure 4.

This service area is based upon extensive interviews with Billings businesses, coal company purchasing patterns and interviews within coal associated communities. Further, Appendix B provides data about the service area of a major Billings hospital.

- Employment is viewed as the primary indicator of economic change. Within the Billings service area (excluding Yellowstone County) applicable 1972 and 1979 figures include:(28)

Year	Direct Coal Employment			Total Resident Employment
	Wyoming	Montana	Total	
1972	100	175	275	34,736
1979	300	1,236	1,536	48,265

Looking at Montana coal employment alone, 97 percent of Montana coal employment was in the 10 county Billings service area in 1979. A local service-to-basic employment ratio of one is applied. This accounts for induced employment. In other words, for every coal employee residing in the service area one local service job is induced in the service area. For the Billings service area, employment associated with coal development is:

Year	Employment		Total
	Direct Coal Employees	Local Service or Induced	
1972	275	275	550
1973	476	476	952
1974	560	560	1,120
1975	742	742	1,484
1976	850	850	1,700
1977	1,062	1,062	2,124
1978	1,474	1,474	2,948
1979	1,536	1,536	3,072

Coal related employment in the Billings service area increased almost six-fold during the past seven years illustrating the rapid development of coal reserves within this area. From 1972 to 1979, total employment in the area grew by 13,520 employees. Coal related employment accounted for 18.6 percent of the growth in total employment within the Billings service area from 1972 to 1979.

Billings service area jobs related to coal development create employment within Billings. For example, Billings and Yellowstone County construction

firms conduct about half of their out-of-county business within the 13 county service area. Based upon the proportion of basic construction employment attributable to the business conducted within the service area, a part of this employment is tied to service area coal development. For each major commercial sector, ratios are developed; they are largely based on the extensive personal interviews. The industry groups of construction; trade; finance, insurance and real estate; services and other conduct 50 percent or more of their "out-of-county business" within the defined 13 county service area. The trade sector is estimated to conduct 60 percent of its out-of-county business within the service area. A large proportion of this business is attributable to the wholesale sector.

The following model is derived for measuring employment attributable to regional coal development on an indirect level:

$$\frac{\text{Coal related employment growth in the service area 1972 to 1979}}{\text{Employment growth in the service area 1972 to 1979}} = \text{Proportion of employment growth attributable to coal in the service area 1972 to 1979}$$

With the above proportion, the next steps include:

$$\begin{array}{l} \text{Proportion of employment growth attributable to coal in the service area from 1972 to 1979} \\ \times \\ \text{Growth in Yellowstone County basic major industry group from 1972 to 1979} \\ \times \\ \text{Market share of major industry group} \\ = \\ \text{Yellowstone County basic employment growth attributable to regional coal development from 1972 to 1979} \end{array}$$

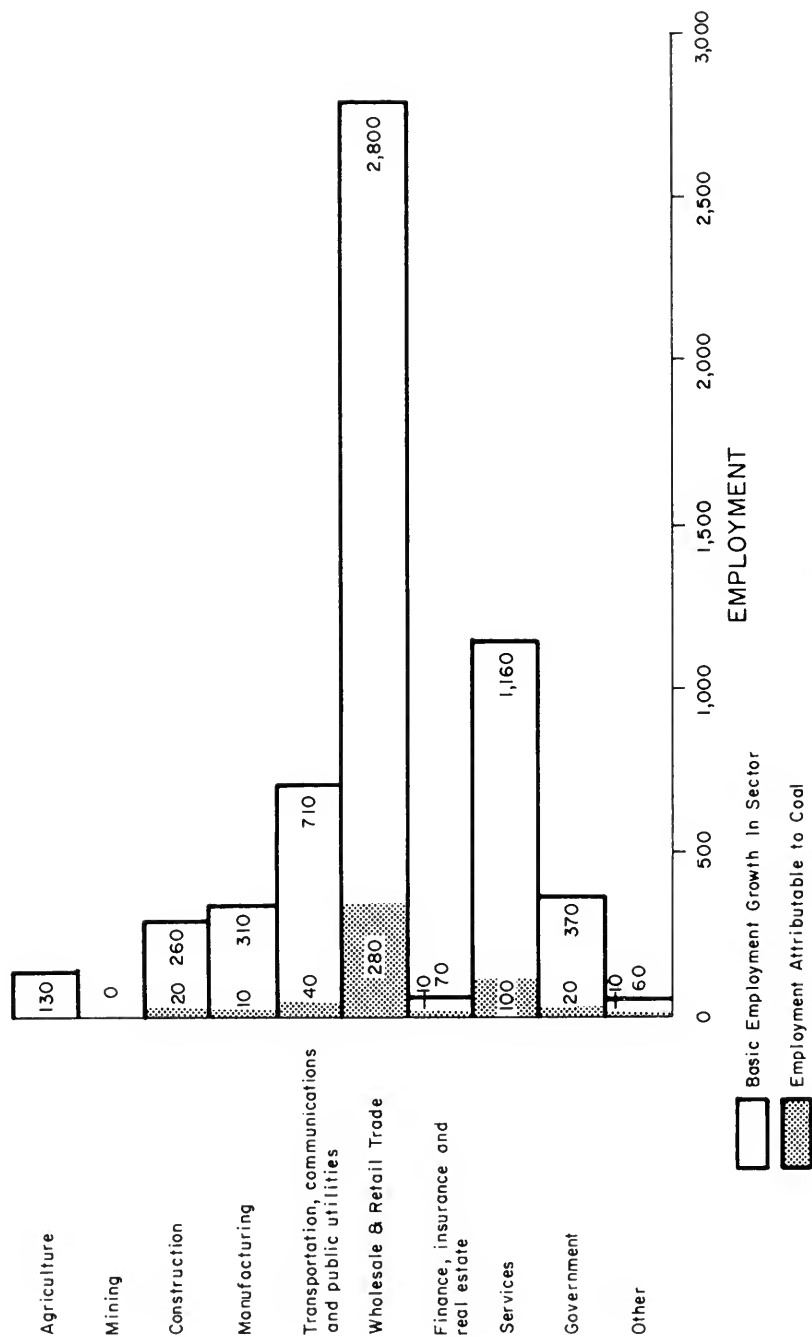
Table 12 presents 1979 Yellowstone County and Billings Urban Area basic employment attributable to indirect coal related employment by major industry group. Billings Urban Area employment approximates 18,000 basic employees in 1979. An estimated 580 employees, or 3.2 percent, of the Billings Urban Area employment is related indirectly to regional coal development. The trade sector accounted for over one-half of this coal related employment in 1979. This situation is because of the large portion of Billings area wholesale trade conducted within the regional coal development areas. Figure 7 illustrates Billings Urban Area basic employment growth attributable to indirect coal related employment by major industry group from 1972 to 1979.

Billings Urban Area basic employment increased by 5,870 employees from 1972 to 1979. Indirect coal related employees accounted for 8.3 percent of basic employment growth in the Billings Urban Area during this period. Indirect coal related employees in the trade sector accounted for almost three-fifths of the growth of indirect coal related employees.

TABLE 12. BILLINGS AND YELLOWSTONE COUNTY 1979 BASIC EMPLOYMENT
ATTRIBUTABLE TO INDIRECT COAL RELATED EMPLOYMENT

Industry Group	Yellowstone County		Billings Urban Area		Percentage of Indirect Basic Employment Attributable to Coal in the Billings Urban Area
	Basic Employment	Indirect Employment Attributable to Coal	Basic Employment	Indirect Employment Attributable to Coal	
Agriculture	1,500	0	380	0	
Construction	1,000	26	890	23	2.6%
Mining	300	0	240	0	
Manufacturing	2,860	24	2,600	22	1.0
Transportation, communication and public utilities	2,540	52	1,910	47	2.5
Trade	6,880	355	6,190	320	5.2
Finance, insurance and real estate	230	15	210	14	6.7
Service	3,550	131	3,180	118	3.7
Government	2,460	28	2,210	25	1.1
Other	200	14	180	13	7.2
TOTAL	21,520	645	17,990	582	3.2%

FIGURE 7. BILLINGS URBAN AREA BASIC EMPLOYMENT GROWTH ATTRIBUTABLE TO INDIRECT COAL RELATED EMPLOYMENT FROM 1972 TO 1979



Note: Billings Urban Area basic employment growth is presented in Table 3.

Historical Effects of Regional Coal Development

The effects of regional coal development on employment, population and households are identified in the following discussion. These effects upon regional coal development are compared with historical growth to illustrate the proportion of socioeconomic influence which coal has had upon the Billings Urban Area.

Employment impacts. Historical employment effects of regional coal development on the Billings Urban Area are evaluated by analyzing the basic employment sectors of the economy. Based upon a large number of personal interviews and methodology discussed previously, three types of employment within the basic employment sectors of the economy are identified as being generated by regional coal development:

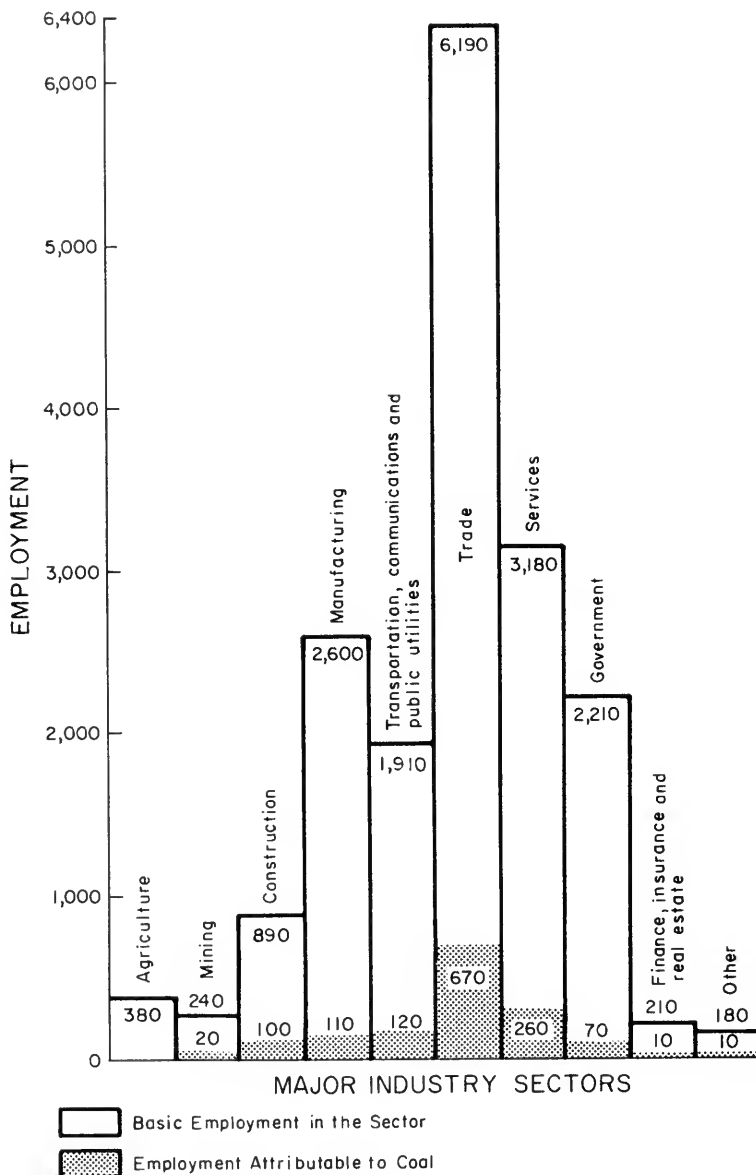
- coal company employees--direct impact
- coal related industry employees--secondary impact
- indirect employment growth--indirect impact

The effects of coal related employment are identified within each basic employment sector of the economy. Coal related employment within each major industry sector is aggregated to arrive at basic employment related to regional coal development by major sector. Figure 8 presents the proportions of Billings Urban Area basic employment traced to regional coal development by major industrial sector in 1979. Basic employment attributable to coal accounted for 7.6 percent of the Billings Urban Area basic employment in 1979; the trade sector represents almost one-half of this basic employment. The service sector currently accounts for approximately one-fifth of the basic coal related employment, followed by transportation, communications and public utilities which represent almost one-tenth.

The proportion of Billings Urban Area basic employment growth which is attributable to regional coal development emphasizes the impact that coal has had on the individual basic employment sectors. Figure 9 illustrates Billings Urban Area basic employment growth tied to regional coal development from 1972 to 1979. Basic employment in the Billings Urban Area grew by 5,870 employees from 1972 to 1979. One-fifth of this growth is associated with regional coal development. The trade sector accounted for almost half of the growth in total basic employment between 1972 and 1979. Likewise, basic employment related to coal in the trade sector accounted for half of the coal related basic employment growth for 1972 to 1979 in the Billings Urban Area. Further, one-third of the basic employment growth experienced in the construction sector was attributable to regional coal development from 1972 to 1979; this represents the highest proportion of coal related growth in any individual sector.

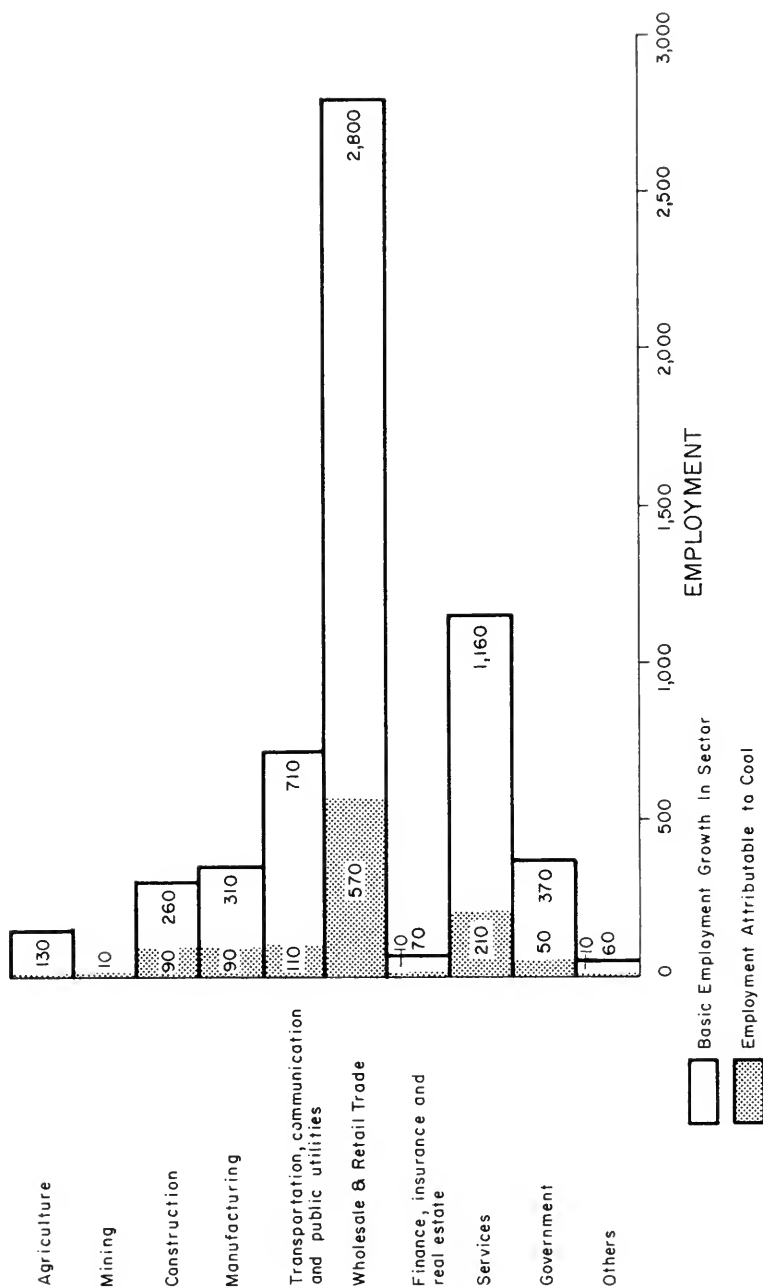
Historical employment effects of regional coal development upon the Billings Urban Area include basic employment attributable to regional coal development, and induced or local service employment based upon regional coal development. Local service employment induced by regional coal development is estimated by multiplying the total coal related basic employment by the local service to basic employment multiplier developed for the historical employment growth in the Billings Urban Area (see Table 3). The estimation of local service employment induced added to coal related basic employment enabled identification of total employment attributable to regional coal development in the Billings

FIGURE 8. BILLINGS URBAN AREA BASIC EMPLOYMENT ATTRIBUTABLE TO REGIONAL COAL DEVELOPMENT IN 1979



Note: Billings Urban 1979 basic employment is within Table 3. Basic employment attributable to coal is from Tables 11 and 12

FIGURE 9. BILLINGS URBAN AREA BASIC EMPLOYMENT GROWTH ATTRIBUTABLE TO REGIONAL COAL DEVELOPMENT FROM 1972 TO 1979



Note: Billings Urban Area basic employment growth is from Table 3, Billings urban area basic employment growth attributable to coal is from Figures 6 and 7.

Urban Area. Table 13 presents Billings Urban Area and Yellowstone County basic and local service employment related to coal development by major industry sector for 1972 through 1979.

Table 13 details by year the Billings Urban Area basic employment growth traced to regional coal development. Employment attributable to coal represented two percent of the total employment in the Billings Urban Area in 1972. From 1972 to 1979, coal related employment has increased almost six-fold to about 3,400 employees, or 7.6 percent of Billings Urban Area employment in 1979. Billings Urban Area employment increased by 14,630 employees from 1972 to 1979. Coal related growth accounted for 19 percent of the total employment growth.

Population effects. Historical coal related employment estimates (see Table 13) are applied in determining the demographic effects that regional coal development has had upon the Billings Urban Area from 1972 to 1979. Labor force related to regional coal development is derived by dividing total employment attributable to coal by rate of employment. Historical Billings Urban Area unemployment rates are considered.

Historical labor force estimates are converted into population estimates through application of workers per household, and person per household ratios. Historical worker per household and person per household ratios for the Billings Urban Area are:(29)

Year	Population	Person Per Household	Total Households	Labor Force	Workers Per Household
1972	77,100	3.03	25,450	31,190	1.23
1973	79,300	2.96	26,790	33,130	1.24
1974	81,500	2.89	28,200	35,350	1.25
1975	83,800	2.86	29,300	38,180	1.30
1976	86,700	2.83	30,640	39,540	1.29
1977	84,600	2.80	32,000	42,270	1.32
1978	92,700	2.77	33,470	44,510	1.33
1979	96,300	2.74	35,150	46,130	1.31

Steady growth rates in the area have resulted in increasing workers per household ratios. In effect, this represents a higher labor participation rate. Persons per household ratios for the Billings Urban Area reflect declining trends.

Table 14 presents demographic effects of regional coal development on the Billings Urban Area. Regional coal development has resulted in an addition of 5,820 Billings Urban Area residents since 1972, totaling 7,340 people in 1979.

Table 15 compares historical population growth attributable with regional coal development and total population growth in the Billings Urban Area. The population growth includes the effects of regional coal development. From an overall viewpoint, the relative effect of regional coal development on the Billings Urban Area population can be viewed as modest. In absolute terms, the impacts are more substantial. In 1979, coal related population represented approximately eight percent of the total population in the Billings Urban Area.

TABLE 13. BASIC AND LOCAL SERVICE EMPLOYMENT ATTRIBUTABLE TO COAL DEVELOPMENT
IN BILLINGS AND YELLOWSTONE COUNTY, 1972 THROUGH 1979*

Industry Group	1972			1973			1974			1975			1976			1977			1978			1979		
	Yellow- stone		Area	Yellow- stone		Area	Yellow- stone		Area	Yellow- stone		Area	Yellow- stone		Area	Yellow- stone		Area	Yellow- stone		Area	Yellow- stone		Area
	County	Urban		County	Urban		County	Urban		County	Urban		County	Urban		County	Urban		County	Urban		County	Urban	
Basic Sectors																								
Mining	11	9		15	12		25	20		10	8		3			1	1		10	8		21	17	
Construction	21	19		51	46		56	50		67	60		74	67		87	78		113	102		117	105	
Manufacturing	27	24		58	52		63	57		75	68		82	74		95	86		122	110		126	113	
Transportation, communications and public utilities	40	20		99	50		110	55		132	66		146	73		172	86		223	112		231	116	
Wholesale and retail trade	115	104		310	279		344	310		418	376		462	416		549	494		718	646		743	669	
Finance, insurance and real estate	3	3		7	6		7	6		9	8		10	9		11	10		15	14		15	14	
Services	47	42		120	108		134	121		161	145		178	160		211	190		275	248		284	256	
Government	16	14		33	30		36	32		43	39		47	42		55	50		70	63		72	65	
Other	2	2		6	5		6	5		8	7		9	8		10	9		14	13		14	13	
Total Basic Employment	282	237		699	588		781	656		923	777		1,011	851		1,191	1,004		1,560	1,316		1,623	1,368	
Local Service Employment	389	346		923	847		1,007	918		1,200	1,080		1,294	1,174		1,644	1,486		2,153	1,921		2,240	2,011	
Total Resident Employment	671	583		1,622	1,435		1,788	1,574		2,123	1,857		2,305	2,025		2,835	2,490		3,713	3,237		3,863	3,379	
Attributable to Coal Development	34,400	29,790		37,200	31,700		39,600	33,870		42,000	36,160		43,600	37,640		46,500	40,240		48,900	42,420		51,300	44,420	
Total Resident Percent of																								
Total Resident Employment																								
Attributable to Regional Coal Development	2.0%	2.0%		4.4%	4.5%		4.5%	4.6%		5.1%	5.1%		5.3%	5.4%		6.1%	6.2%		7.6%	7.6%		7.5%	7.6%	
Local Service to Basic Ratio	1.38	1.46		1.32	1.44		1.29	1.40		1.30	1.39		1.28	1.38		1.38	1.48		1.38	1.46		1.38	1.47	

*Billings Urban Area basic employment traceable to coal is based on Figures 8 and 9.

TABLE 14. HISTORIC DEMOGRAPHIC EFFECTS OF REGIONAL COAL DEVELOPMENT
ON THE BILLINGS URBAN AREA, 1972 THROUGH 1979*

Year	Employment	Labor Force	Households	Population
1972	580	610	500	1,520
1973	1,440	1,500	1,210	3,580
1974	1,570	1,640	1,310	3,790
1975	1,860	1,960	1,510	4,320
1976	2,030	2,130	1,650	4,670
1977	2,490	2,620	1,980	5,540
1978	3,240	3,400	2,560	7,090
1979	3,380	3,510	2,680	7,340

*Coal related employment is from Table 13. Labor force, households and population are derived through historic population multipliers.

TABLE 15. BILLINGS URBAN AREA POPULATION AND HOUSEHOLD GROWTH ATTRIBUTABLE TO REGIONAL COAL DEVELOPMENT FROM 1972 THROUGH 1979*

Year	Households Attributable to Regional Coal Development	Billings Urban Area Households	Population Attributable to Regional Coal Development	Billings Urban Area Population	Proportion of Coal Related Population to total Billings Urban Area Population
1972	500	25,450	1,520	77,100	2.0%
1973	1,210	26,790	3,580	79,300	4.5
1974	1,310	28,200	3,790	81,500	4.7
1975	1,510	29,300	4,320	83,800	5.2
1976	1,650	30,640	4,670	86,700	5.4
1977	1,980	32,000	5,540	89,600	6.2
1978	2,560	33,470	7,090	92,700	7.6
1979	2,680	35,150	7,340	96,300	7.6

*See Table 14.

By contrast, during the past seven years, coal related population has increased almost five-fold; it accounts for almost one-third of the population growth in the Billings Urban Area during this period, or an increase of 5,820 residents.

Summary

Regional coal development has fostered growth within the Billings Urban Area over the past seven years. Growth attributable to regional coal development is viewed as employment that is coal related and residing in the Billings Urban Area. Coal related employment encompasses coal employees of coal companies, coal related employees in linked industries, and induced employment.

Approximately 3,400 employees of the 1979 Billings Urban Area employment of 44,420 are attributable to regional coal development. The net effect of coal related employment represents eight percent of the Billings Urban Area employment and population.

About 7,340 people residing in 2,680 households in the Billings Urban Area are identified as being attributable to regional coal development in 1979. Regional coal development has accounted for almost one-third of the population growth from 1972 to 1979 in the Billings Urban Area. Population associated with regional coal development increased almost five-fold--5,820 people--while Billings Urban Area population grew by 19,200 people over the past seven years.

SECTION IV. FUTURE IMPLICATIONS OF REGIONAL COAL DEVELOPMENT ON BILLINGS

This section examines the future implications that regional coal development will have on employment, population and households within the Billings Urban Area. Population and employment forecasts which include the effects of regional coal development are initially considered. Population and employment growth associated with future regional coal development are then isolated from the overall projections. Fiscal effects are related to coal developments.

Total Population Projections

The Population Handbook 1975 prepared in July 1975, and updated in 1979, by the Billings-Yellowstone City-County Planning Department provides Billings and Yellowstone County population projections. The methodology employed by the planning department in forecasting population takes into account births, deaths and migration patterns. Billings and Yellowstone County population projections account for the effects of regional coal development. Population projections for 1980 to 1990 are:

Year	Yellowstone County	Billings Urban Area	City of Billings
1980	111,800	96,500	80,100
1985	126,800	111,600	91,800
1990	142,500	127,900	104,300

Yellowstone County population is projected to increase by 30,700 persons from 1980 to 1990 for an annual average growth rate of 2.5 percent. The Billings Urban Area population is expected to grow one-third during the 1980 to 1990 period, from 96,500 persons to 127,900 persons respectively. The Billings Urban Area population will represent 90 percent of county population by 1990.

Households. Household projections for the Billings Urban Area assume a persons per household ratio for new residents of 2.74 in 1980 decreasing to 2.65 persons per household by 1990. The declining trend in person per household is consistent with the prior historical trends. Table 16 presents household, population and employment projections for the Billings Urban Area, 1980 to 1990. An additional 13,110 housing units (assuming units equate to households) will be needed between 1979 and 1990 in the Billings Urban Area.

Employment Projections

Billings Urban Area population and household projections are applied in determining employment projections. Worker per household ratio is forecasted and applied to the household estimates, yielding a labor force estimate. An unemployment rate is projected for the Billings Urban Area, producing employment estimates.

TABLE 16. POPULATION AND RELATED FORECASTS FOR
THE BILLINGS URBAN AREA, 1979 THROUGH 1990*

Year	Population	Households	Labor Force	Employment
1979	96,300	35,150	46,130	44,420
1980	96,500	35,350	46,310	44,460
1981	99,300	36,370	47,640	45,730
1982	102,300	37,610	49,650	47,660
1983	105,300	38,860	51,300	49,250
1984	108,400	40,150	53,400	51,260
1985	111,600	41,490	55,180	52,970
1986	114,700	42,640	56,710	54,440
1987	117,800	40,960	58,910	56,550
1988	121,100	45,360	60,780	58,350
1989	124,400	46,770	63,140	60,610
1990	127,900	48,260	65,150	62,540

*Population, households and employment for the Billings Urban Area include the effects of regional coal development. Population projections are through the Billings-Yellowstone City-County Planning Department, March 1980.

Worker per household. Over recent years the worker per household ratio of the Billings Urban Area has increased:

Year	Billings Urban Area Workers Per Household
1970	1.23
1975	1.30
1979	1.31

Future worker per household ratios are anticipated to increase gradually from 1.31 in 1980 to 1.35 in 1990. This is consistent with a steadily expanding economy and national trends toward, for example, more women and young persons in the labor market; a higher labor participation rate follows.

Unemployment rate projections. Billings Urban Area annual average unemployment rates have averaged 4.5 percent since 1972; in 1979, the annual average dropped to 3.7 percent. Because of the steady population increase projected from 1980 to 1990 and the historical expansion in the Billings Urban Area economy, the unemployment rate is likely to remain near recent trends; 4.0 percent is projected for 1980 through 1990.

Employment forecasts. Table 16 previously presented employment forecasts for the Billings Urban Area. These forecasts include the effects of regional coal development. Billings Urban Area employment is projected to increase by about 18,120 persons between 1979 and 1990 for a 40.8 percent increase. The employment projections through 1990 indicate a slower rate of growth than the Billings Urban Area experienced during the 1972 to 1979 period.

Basic and local service employment projections. Billings Urban Area basic employment is forecasted to enable the future disaggregation of basic employment traceable to regional coal development. Based upon recent trends, a 1.5 local service to basic ratio is applied to total employment projections to determine basic and nonbasic (local service) employment. Table 17 presents Billings Urban Area basic and local service employment projections from 1979 to 1990. Basic employment is expected to increase by over 7,000 persons over the next 10 years, totaling 25,020 employees by 1990.

Future Effects of Regional Coal Development

This portion of Section IV considers future economic and demographic effects of regional coal development upon the Billings Urban Area. The incremental effects of employment, population and households attributable to regional coal development are identified. Regional coal development impacts are compared with future growth to illustrate the proportion of socioeconomic influence which coal will have upon the Billings Urban Area.

Employment impacts. Basic employment traceable to regional coal development is evaluated when forecasting Billings Urban Area employment attributable to regional coal development. The coal employment multiplier indicates the level of Billings Urban Area basic employment induced by coal related employees living in the Billings service area in a given year. The trends in this

TABLE 17. PROJECTED BASIC AND LOCAL SERVICE BILLINGS URBAN AREA EMPLOYMENT
FOR 1980 THROUGH 1990*

Year	Basic	Local Service	Total
1979	17,990	26,430	44,420
1980	17,780	26,680	44,460
1981	18,290	27,440	45,730
1982	19,060	28,600	47,660
1983	19,700	29,550	49,250
1984	20,500	30,760	51,260
1985	21,190	31,780	52,970
1986	21,780	32,660	54,440
1987	22,620	33,930	56,550
1988	23,340	35,010	58,350
1989	24,240	36,370	60,610
1990	25,020	37,520	62,540

*Aggregate employment figures are from Table 16. A local service to basic ratio of 1.5 is assumed from 1980 to 1990.

coal employment multiplier indicate the extent of basic employee response to changes in service area coal related employment. For 1974 through 1979, Billings Urban Area basic coal related employment and Billings service area coal related employment are:

	Billings Service Area Coal Related Employment	Billings Urban Area Basic Coal Related Employment	Ratio of Billings Urban Area Basic Coal Related Employment to Service Area Coal Related Employment
1974	1,120	660	.59
1975	1,480	780	.53
1976	1,700	850	.50
1977	2,120	1,000	.47
1978	2,950	1,320	.45
1979	3,070	1,370	.45

In 1979, there were 3,070 coal related employees in the Billings service area. Further, 1,370 Billings Urban Area basic employees were attributable to coal. This represents a .45 coal employment multiplier, or for every coal related job in the Billings service area, there exists .45 basic coal related jobs in the Billings Urban Area.

From 1974 to 1979, the coal employment multiplier has shown a steady decline. This situation indicates that basic coal related employment in the Billings Urban Area has become more utilized and efficient in its ability to service the growth in regional coal developments. A coal employment multiplier of .45 is applied to forecast Billings Urban Area basic coal related employment for 1980 through 1990.

Coal related employment in the service area is projected to more than double over the next 10 years. Projected coal related employment residing in the Billings service area from 1980 to 1990 is:

Year	Direct Coal Employees	Local Service or Induced	Employment Attributable To Future Coal Development
1980	1,550	1,550	3,100
1981	1,690	1,690	3,380
1982	1,730	1,730	3,460
1983	1,810	1,810	3,620
1984	2,020	2,020	4,040
1985	2,280	2,280	4,560
1986	2,570	2,570	5,140
1987	3,100	3,100	6,200
1988	3,100	3,100	6,200
1989	3,280	3,280	6,560
1990	3,340	3,340	6,680

Multiplying the derived coal employment multiplier (.45) times the projected service area coal related employment produces future Billings Urban Area basic employment attributable to regional coal development. Basic employment traceable to regional coal development from 1979 to 1990 is:

Year	Billings Service Area Coal Related Employment	Coal Employment Multiplier (.45)	Billings Urban Area Basic Employment Attributable to Coal
1979	3,070		1,370
1980	3,100		1,400
1981	3,380		1,520
1982	3,460		1,560
1983	3,620		1,630
1984	4,040		1,820
1985	4,560		2,050
1986	5,140		2,310
1987	5,740		2,580
1988	6,200		2,790
1989	6,560		2,950
1990	6,680		3,010

Billings Urban Area basic employment as a result of regional coal development is projected to more than double from 1979 to 1990. Figure 10 illustrates Billings Urban Area basic employment growth traceable to regional coal development. From 1979 to 1980 basic employment is projected to increase by 7,000 employees of which approximately one-quarter are attributable to coal.

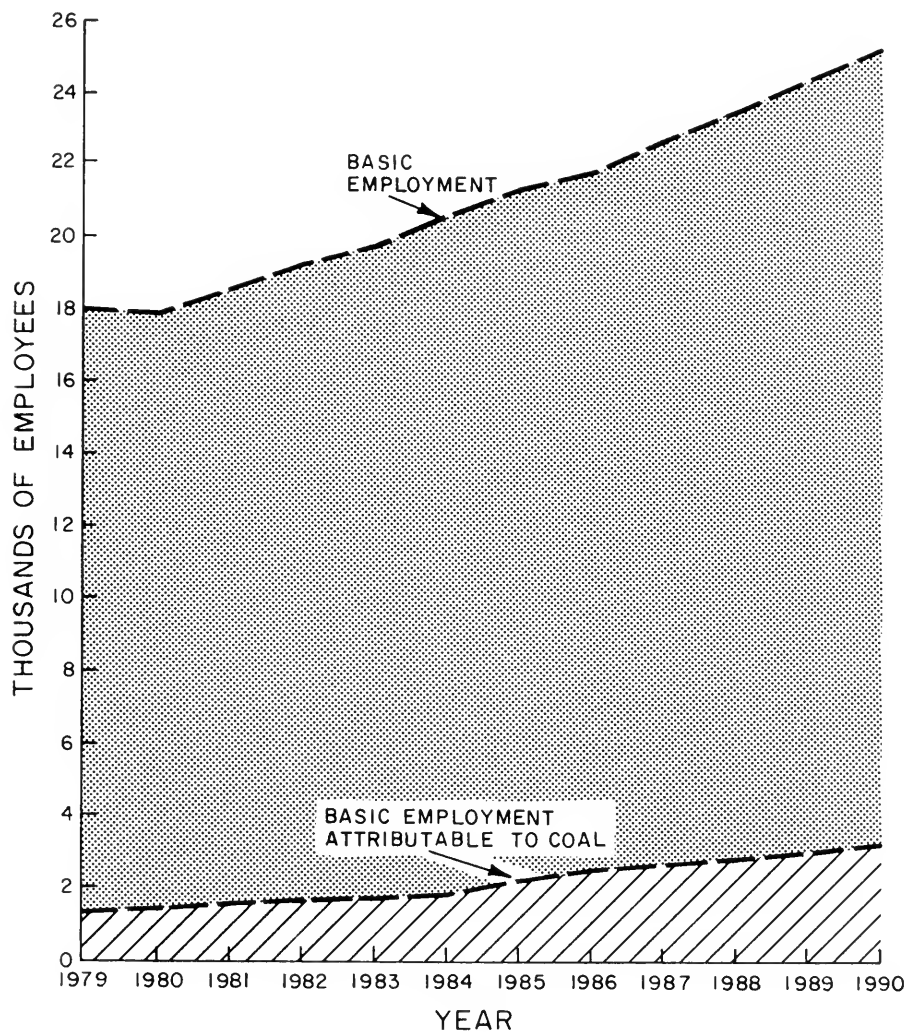
Local service employment induced by regional coal development is estimated by multiplying the basic coal related employment times the local service to basic employment multiplier. Table 18 presents projected Billings Urban Area basic and local service employment tied to regional coal development for 1979 through 1990.

Employment as a result of future regional coal development increases from 3,380 persons in 1979, to 7,530 persons by 1990. Employment traceable to coal represents 12 percent of 1990 Billings Urban Area employment. Figure 11 illustrates Billings Urban Area employment growth attributable to regional coal development from 1979 to 1990. By 1990, employment is forecasted to increase by 18,120 persons; approximately one-quarter of this growth will be due to regional coal development.

Population effects. Projected coal related employment estimates are considered in determining the demographic effects of regional coal development on the Billings Urban Area from 1979 to 1990. Labor force projections are converted into population projections through the application of worker per household and population per household ratios.

Table 19 provides future population effects of regional coal development on the Billings Urban Area. Regional coal development will result in 15,400

FIGURE 10. PROJECTED BILLINGS URBAN AREA BASIC EMPLOYMENT GROWTH ATTRIBUTABLE TO REGIONAL COAL DEVELOPMENT FROM 1979 THROUGH 1990

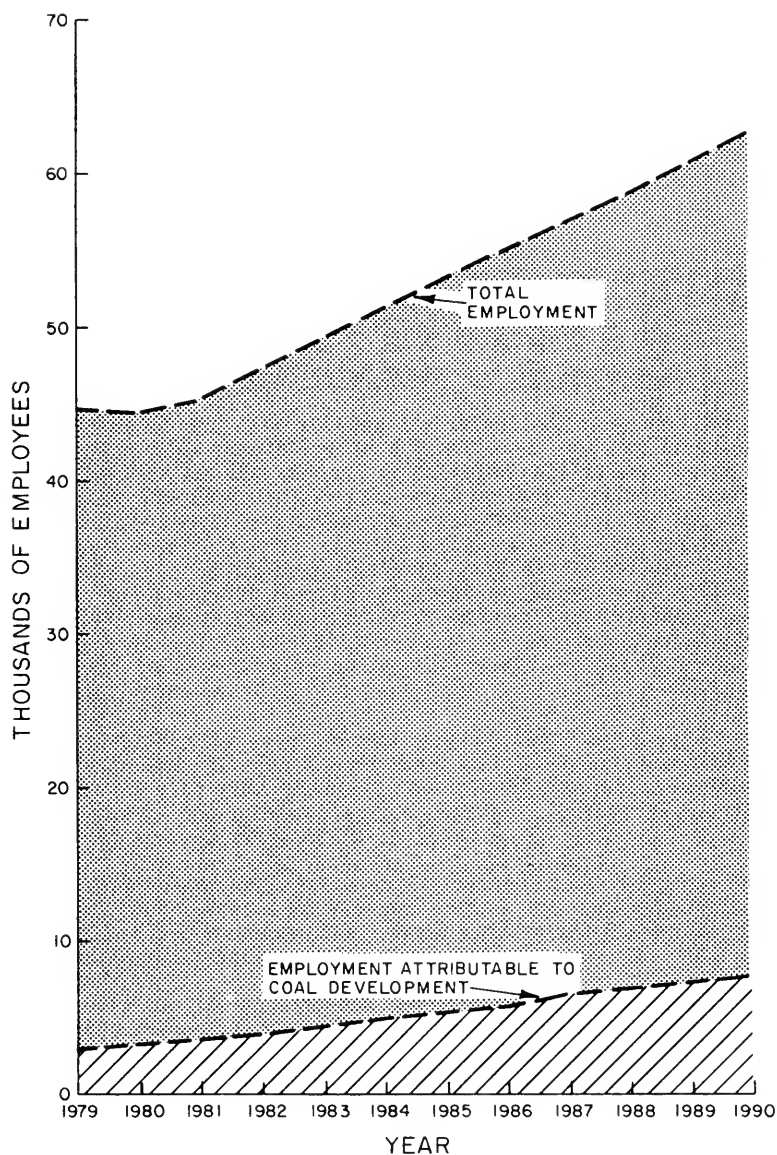


Source : See Tables 17 and 18.

TABLE 18. PROJECTED BASIC AND LOCAL SERVICE BILLINGS URBAN AREA EMPLOYMENT ATTRIBUTABLE TO REGIONAL COAL DEVELOPMENT FROM 1979 THROUGH 1990

[illegible]

FIGURE 11. PROJECTED BILLINGS URBAN AREA EMPLOYMENT GROWTH
ATTRIBUTABLE TO REGIONAL COAL DEVELOPMENT FROM
1979 THROUGH 1990



Source: See Table 18.

TABLE 19. DEMOGRAPHIC EFFECTS OF REGIONAL COAL DEVELOPMENT ON THE
BILLINGS URBAN AREA FROM 1979 THROUGH 1980*

Year	Employment	Labor Force	Households	Population
1979	3,380	3,510	2,680	7,340
1980	3,500	3,650	2,790	7,620
1981	3,800	3,960	3,020	8,240
1982	3,900	4,060	3,080	8,380
1983	4,080	4,250	3,220	8,730
1984	4,550	4,740	3,560	9,610
1985	5,130	5,340	4,020	10,810
1986	5,780	6,020	4,530	12,190
1987	6,450	6,720	5,010	13,430
1988	6,980	7,270	5,430	14,500
1989	7,380	7,690	5,700	15,160
1990	7,530	7,840	5,810	15,400

*Billings Urban Area employment associated with regional coal development is from Table 18. Labor force, households and population estimates are derived through population multipliers.

people residing in 5,810 households by 1990. This represents an increase of 8,060 residents attributable to regional coal development over the 1979 coal related population.

Table 20 compares forecasted population growth traceable to regional coal development and total population growth in the Billings Urban Area. The population forecast includes the effects of regional coal development. Figure 12 illustrates the proportion of population growth attributable to regional coal development from 1979 to 1990. The anticipated growth pattern is fairly constant without discontinuity; further, this trend is lower than experienced over the past several years.

By 1990, coal related population will represent 12 percent of the total population in the Billings Urban Area. From 1979 to 1990 coal related population will represent over one-quarter of the population growth predicted for the Billings Urban Area.

Fiscal Effects of Coal Related Population Growth on City Operations

The ability of the city to generate sufficient revenues and provide services to a growing city population is a function of the tax structure, the desired levels of service and the adequacy of existing facilities. Using 1980 as a stepping off point, the following discussion describes Billings' general fund revenue and expenditure characteristics, and presents forecasts of future fiscal capacity (supporting materials are presented in Appendix C). An analysis of the city's past budgets and interviews with local officials indicate that city revenues have not kept pace with population growth and demand for services. The major sources of city revenues, property taxes, governmental transfers and local fees, have not grown as rapidly as inflation sensitive service demands. Expenditures have continued to rise despite personnel layoffs, reduced service levels and deferred capital investment.

Projections of city revenues and general operation expenditures are presented in Table 21 and 22. The trends evidenced in these forecasts provide insights into the city's ability to service additional population growth, given existing tax structures and present service levels. Certain assumptions are applied in preparing the projections:

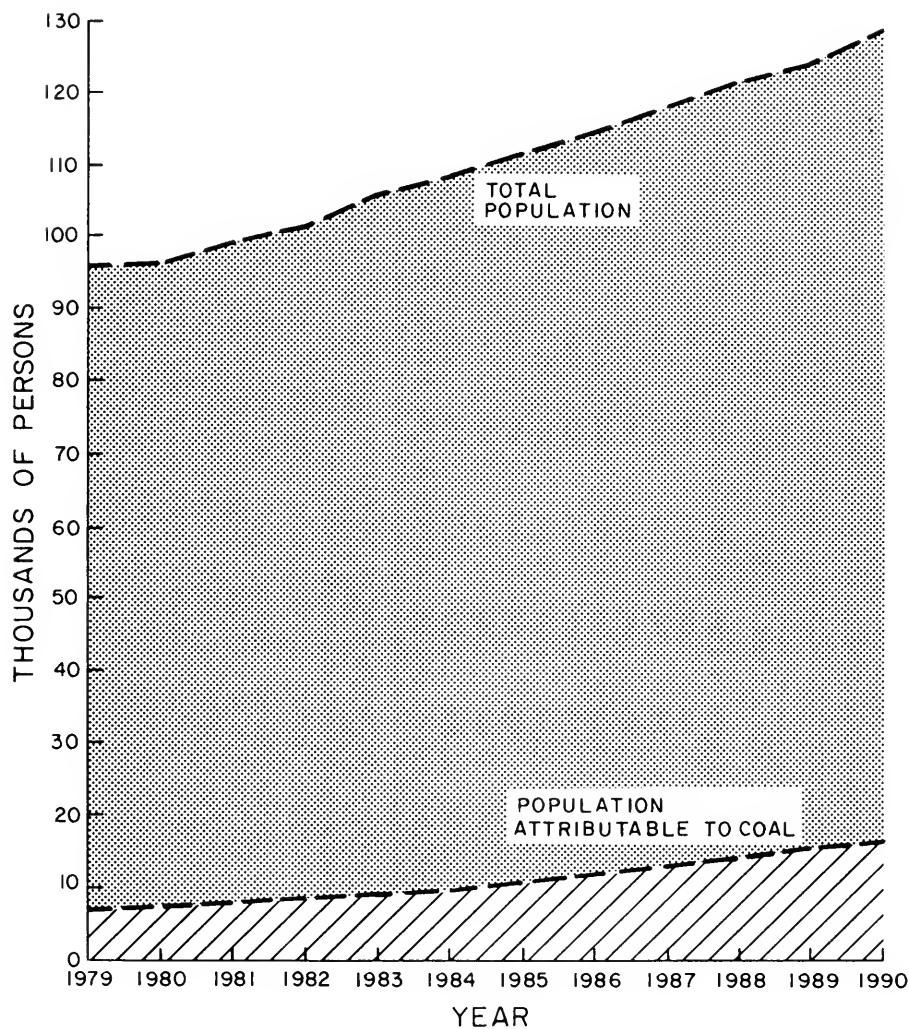
- All projections are stated in fiscal year 1980 dollars. Inflationary effects on revenue sources and expenditure items are not accounted for. These effects are discussed later in this section.
- Property tax levies, license and permit costs, and state intergovernmental distribution formulas are held at existing rates.
- Revenue and expenditure growth assumptions are based on past trends, estimations of present service adequacy and interviews with selected government officials regarding future requirements.
- Each revenue line item is projected separately based on the relationship between population growth and revenue

TABLE 20. BILLINGS URBAN AREA POPULATION AND HOUSEHOLD GROWTH ATTRIBUTABLE TO REGIONAL COAL DEVELOPMENT FROM 1979 THROUGH 1990*

Year	Households Attributable to Regional Coal Development	Total Billings Urban Area Area Households	Population Attributable to Regional Coal Development	Total Billings Urban Area Population	Proportion of Coal Related Population to Total Billings Urban Area Population
1979	2,680	35,150	7,340	96,300	7.6%
1980	2,790	35,350	7,620	96,500	7.9
1981	3,020	36,370	8,240	99,300	8.3
1982	3,080	37,610	8,380	102,300	8.2
1983	3,220	38,860	8,730	105,300	8.3
1984	3,560	40,150	9,610	108,400	8.9
1985	4,020	41,490	10,810	111,600	9.7
1986	4,530	42,640	12,190	114,700	10.6
1987	5,010	43,960	13,430	117,800	11.4
1988	5,430	45,360	14,500	121,100	12.0
1989	5,700	46,770	15,160	124,400	12.2
1990	5,810	48,260	15,400	127,900	12.0

*See Tables 16 and 19.

FIGURE 12. FORECASTED BILLINGS URBAN AREA POPULATION GROWTH
ATTRIBUTABLE TO REGIONAL COAL DEVELOPMENT FROM
1979 THROUGH 1990



Source : See Table 20.

TABLE 21. ANNUAL GENERAL FUND REVENUE ESTIMATES, CITY OF BILLINGS FOR FISCAL YEARS 1980-1990 (THOUSANDS OF DOLLARS)

Revenue Items	Fiscal Year										
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Property and personal property tax	\$ 5,681	\$ 5,950	\$ 6,090	\$ 6,260	\$ 6,431	\$ 6,608	\$ 6,793	\$ 6,971	\$ 7,148	\$ 7,333	\$ 7,526
Motor vehicle tax	410	400	412	423	435	446	459	471	483	495	508
Court revenues	657	700	741	761	782	804	826	848	870	892	915
Licenses and permits	616	625	658	677	695	714	734	754	773	793	814
Charges for services	648	1,000	1,028	1,057	1,086	1,116	1,147	1,177	1,207	1,239	1,271
Public works revenue	748	775	802	825	847	867	895	918	942	966	992
Intergovernmental	1,700	1,760	1,811	1,861	1,912	1,965	2,019	2,072	2,125	2,178	2,237
Revenue sharing	853	850	850	850	850	850	850	850	850	850	850
Miscellaneous	671	681	699	719	739	760	780	801	821	842	864
Grants to operations	585	600	617	635	652	670	689	706	725	743	763
Total revenues:	\$12,569	\$13,341	\$13,708	\$14,068	\$14,429	\$14,800	\$15,192	\$15,568	\$15,944	\$16,331	\$16,740

Note: Revenue estimates are not equal to city "General Fund" revenue estimates because certain revenue sources defined as independent funds by the city finance department are included in the above estimates. Examples of such revenue sources are library related property assessment, revenue sharing and certain intergovernmental funds.

TABLE 22. ANNUAL EXPENDITURE ESTIMATES FOR CITY OF BILLINGS OPERATIONS FOR FISCAL YEARS 1980-1990 (THOUSANDS OF DOLLARS)

Expenditure Categories	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
General government	\$ 2,152	\$ 2,163	\$ 2,222	\$ 2,284	\$ 2,346	\$ 2,411	\$ 2,479	\$ 2,543	\$ 2,608	\$ 2,675	\$ 2,746
Law enforcement	3,094	3,124	3,210	3,299	3,389	3,483	3,580	3,674	3,767	3,865	3,966
Fire protection	2,590	2,643	2,716	2,792	3,041	3,213	3,213	3,391	3,478	3,568	3,661
Public works	4,526	4,566	4,691	4,822	4,953	5,090	5,233	5,369	5,506	5,649	5,797
Parks and recreation	969	1,012	1,029	1,110	1,130	1,161	1,193	1,319	1,352	1,387	1,424
Library	859	881	905	931	956	982	1,010	1,036	1,063	1,090	1,119
Subtotal	\$14,190	\$14,389	\$14,773	\$15,238	\$15,815	\$16,340	\$16,708	\$17,332	\$17,774	\$18,234	\$18,713
Enterprise operations*	\$10,159	\$10,413	\$10,699	\$11,083	\$11,470	\$11,877	\$12,300	\$12,717	\$13,137	\$13,577	\$14,035

*Enterprise operations exclude capital outlays which equaled \$26.3 million in 1980.

Note: Expenditure estimates for 1980 may not equal published "General Fund" figures because certain independent funds such as revenue sharing, library operations, street fund and storm sewer funds have been included in the appropriate expenditure category.

generation. Almost all revenue sources will grow in direct proportion to population increases. Certain revenue items are anticipated to lag behind population growth while others will slightly exceed population development.

- Budget forecasts are for general fund revenues and general operating costs. Enterprise funds are expected to operate on a self-sufficient basis with rate increases occurring as needed.
- Revenues and expenditures for fiscal year 1980 are based on the proposed 1980 budget. Actual expenditures and collections will vary.
- Expenditures for long term capital investment are excluded from these forecasts; they represent additional costs which are addressed separately. The availability of certain federal programs to help finance these developments, the changing requirements of the city's population, and the potential for investment deferment combine to make projections highly uncertain.

Revenue

Revenues from general and special fund sources are anticipated to reach nearly \$12.6 million during the current fiscal year. Local property taxes will generate nearly one-half of these funds, while revenue from non-local sources, including intergovernmental transfers, revenue sharing and miscellaneous grants, represent nearly 25 percent of the city's annual budget.

Property tax collections (in present dollars) are expected to climb 32 percent between 1980 and 1990; it is assumed that delinquent payments will not rise above present levels. Other local sources are forecasted to generally increase in relation to future population growth. Non-local funds represent an important but uncertain source of future city revenues. State generated funds are expected to continue to develop as the city population grows and the state experiences continued energy development. Federal transfers, in the form of revenue sharing and categorical grants, are expected to play a declining role in local financing as the Federal Government responds to public pressure for expenditure constraints.

In sum, given present revenue generating structures, Billings city revenues are anticipated to grow at approximately three percent per year (present dollars). Property taxes and intergovernmental revenues will continue to be the city's largest revenue sources.

Expenditures

General operating expenditures by use category are forecast in Table 22. Projections for fiscal year 1980, based on city budget forecasts, are in excess of general revenues by over 10 percent. This deficit will be covered through income from investments, expenditures of cash reserves, unanticipated revenues, transfers from enterprise funds or reduced services. Historically,

the public works department has represented the largest category of city expenditures. Public works costs are primarily associated with road construction, maintenance, and traffic control expenses. Revenues from the state's redistribution of gasoline and vehicle licensing taxes cover a large portion of these costs. Road maintenance costs have escalated in recent years and improvement programs have been reduced. If the city wishes to retain the present level of services, or undertake additional road improvements, expenditures will increase substantially. Fire and police services represent over 40 percent of 1980 projected expenditures even though personnel and services have been reduced. Fire protection costs are anticipated to increase more rapidly than population growth as new substations with additional personnel and equipment will be required to serve new geographical growth in the city. Parks and recreation expenses will also increase if the city is to maintain present services for new residents. Total city expenditure demands, assuming existing service levels, are projected to grow slightly in excess of anticipated population growth.

Enterprise operations are expected to incur additional expenses roughly in line with population growth. Billings utilities are assumed to remain self-sufficient with costs of operation, debt service and system expansion to be absorbed by new and existing customers.

The continuation of enterprise fund self-sufficiency will require regular rate increases as the effect of inflation outpaces new revenues. The growth of the city through annexation will require the expansion of city utility services with considerable front-end expenditures. Although the enterprise funds should remain solvent through utilization of special district funding, bonding or rate increases, the increased cost burden on the citizenry will make the levying of new taxes for other city operations particularly burdensome.

It is anticipated that the city's enterprise funds will incur considerable capital investment expenses, primarily associated with utility line expansion and sewerage treatment improvements. The utility department can finance these needs with special improvement districts, revenue bonds or new general obligation bonds. Annexation of new areas, already developed but in need of improvements such as sewerage lines, will present the greatest financial burden. Certain funds will achieve economies of scale that will lessen future costs on a per capita basis. For example, the solid waste collection division has a well maintained rolling stock and a disposal site with many years of use remaining. Increased population growth, in terms of capital needs, should be absorbed smoothly. Unfortunately, solid waste collection is energy-intensive and thus the costs of operations have risen rapidly, creating a need for new rate increases.

Operating funds and general services typically have been deferring some capital expenditures for a number of years. Older rolling stock and equipment owned by the police and fire department's are being used past previous replacement intervals. Improvements to facilities, parks and recreational areas have also been deferred. Although present levels remain adequate, long term capital investment can not be continually deferred without eventually reducing service quality.

Presently, the city has \$1.9 million in outstanding municipal debt largely associated with a 1973 fire station construction bond. The city is allowed to incur debt up to 18 percent of taxable valuation for general operations and up to 36 percent for water projects. Assuming voter approval, general

obligation bonds remains a possible source of capital improvements funds. The City maintains a cash reserve in excess of \$10.0 million, which is potentially available for future expenditures.

Summary of Fiscal Forecasts

The City of Billings has experienced financial difficulties for a number of years. Historically, expenditures and revenues have been balanced only by reducing service levels and through the city's success in attracting federal grants. According to projections presented here, demands for city services from a growing city population will continue to outstrip the city's financial resources for the foreseeable future.

Over the past three years, city services have been pressed to minimize expenses. Personnel levels in key departments, such as police and fire, have been reduced, routine expenditures have been deferred, user charges have been increased, and in certain instances, programs have been entirely eliminated. Nevertheless, the city continues to draw on its cash reserve and is actively contemplating further large scale program reductions. Unless new sources of revenue are identified, services for old and new residents will continue to decline.

The effect of inflation, not accounted for in the previous forecasts, further exacerbates the city's financial problems. None of the city's revenue sources is effectively indexed for inflation. Locally imposed license, permit fees and service charges must be raised periodically to keep pace with inflation. Since there is considerable public resistance to increase taxation, these fees tend to decline in terms of present value receipts. Additionally, the city is dependent on transfer payments from state and federal sources to maintain city operations. Continuation of these funds, particularly federal monies, is highly uncertain. The city's primary revenue source, local property taxes, will grow as the city's taxable base increases. Nevertheless, new assessments tend to lag behind market value increases and property tax receipts lag still further behind. In effect, the city has no revenue source that reflects inflationary pressures. On the other hand, nearly all city expenditures are affected by inflation. Salary and wages, equipment costs, energy costs, supplies such as asphalt and construction materials all continue to climb in cost. The city is considering a number of new taxes, including a separate mill levy for transit costs, an increased city mill levy, and a city excise tax on gasoline sales. Although these revenues, particularly a gasoline tax, would generate additional revenues as growth occurred, the city's fundamental fiscal weaknesses would remain.

Billings is not unique in its financial position, but two unusual characteristics of Montana law and Billings' role in the state's economy exaggerate the city's condition. As Montana's largest community and primary service center, the city in effect provides a large number of services for many non-residents. As discussed earlier, people from southern Montana and northern Wyoming utilize Billings as a shopping and entertainment center. This has the beneficial effect of generating local employment. It also places increased demands on the city, particularly for transportation maintenance costs, but also for police, fire and library services, recreation, etc. The city's enterprise operations such as water and sewer services as well as general operations are also utilized by non-residents but largely supported by city residents.

Many communities with regional service based economies rely heavily on sales tax receipts to support city operations. Typically, a regional service center will receive a large portion of its general revenue from sales tax collections, thus sharing the tax burden among a larger group of users. The prohibition against sales tax in Montana has particularly adverse effects on the City of Billings.

Population and coal development forecasts presented previously indicate that coal related employment in the Billings Urban Area will represent approximately 25 percent of future growth. Unlike small rural communities that experience direct coal employment impacts, the employment growth in Billings induced as a result of coal development will occur in a number of employment sectors among a range of incomes. This growth is largely indistinguishable from other community growth.

The City of Billings finds itself in the position of many towns in growth areas. The city will grow as a result of coal development by approximately 800 persons per year from 1980 to 1990. These new residents require a full complement of services from a community already experiencing fiscal imbalances. Property tax revenues from coal developments accrue entirely to other jurisdictions and severance tax revenues go to the state to be redistributed. The city receives local property tax receipts and general local service fees to pay for services. In other states, a community in Billings' position would derive revenues from sales tax receipts to provide for new growth. Billings finds itself unable to generate sufficient local revenues to fully accommodate pressures partially caused by coal induced demands.

Appendix

APPENDIX A
Business Interview Results

From January through May 1980, interviews were conducted with approximately 200 public and private organizations representing all economic sectors of the Billings economy, (see Exhibit A-2). The purpose of these interviews was to identify those industry groups within the Billings economic base which have economic linkages with the regional coal industry.

The distribution of interviews by type of organization is:

Category	Frequency	Distribution
Retail	23	11.6%
Service	38	19.1
Manufacturing	13	6.5
Finance, Insurance and Real Estate	6	3.0
Agriculture	3	1.5
Transportation, Communication and Public Utilities	19	9.5
Construction	6	3.0
Wholesale	86	43.2
Government	<u>5</u>	<u>2.5</u>
Total	199	99.9%*

*In this and subsequent tabulations, percentage totals might not equal 100.0 percent due to rounding or multiple responses.

Of the 199 firms, 103 were identified as within 14 coal related industry groups. A coal related industry group included several firms which had a meaningful portion of business directly attributed to regional coal development. The responses of firms classified within a coal related industry group are presented in the following pages. The interview form used is included in this appendix as Exhibit A-1.

The following survey tabulations identify coal related industry groups by description and SIC Code. The survey results are tabulated by the industry group's SIC Code. Certain industry groups are combined into one industry group because of disclosure limitations or similarity in activity performed among industry groups:

KEY TO COAL RELATED INDUSTRIES

<u>SIC Code</u>	<u>Industry Group</u>
	<u>Construction</u>
154 & 162	Heavy Construction and General Building Contractors - Nonresidential Buildings.
	<u>Manufacturing</u>
291	Petroleum Refining
2452	*Prefabricated Wood Buildings and Components
344	Fabricated Structural Metal Products
	<u>Transportation, Communication and Public Utilities</u>
451	Air Transportation, Certified Carriers
401	*Railroad Transportation
	<u>Wholesale Trade</u>
501	Motor Vehicles and Automotive Parts and Supplies
505	Metal Service Centers and Offices
503	Electrical Apparatus and Equipment, Wiring Supplies and Construction Material
508	Machinery, Equipment and Supplies
	<u>Services</u>
7394	Equipment Rental and Leasing Services
7692 & 7694	Welding Repair and Armature Rewinding Shops
891	Engineering, Architectural and Surveying Services
	<u>Public Administration Government</u>
7391 & 9512	Land, Mineral, Wildlife and Forest Conservation, and Research and Development

*Prefabricated Wood Buildings and Railroad Transportation Coal Related Industry Group's responses were not tabulated because of the smallness in sample size.

1b. When was your firm established?

Year Established	Coal Related Industry Group by SIC Code													Total All Firms	
	154 162	291	344	451	501	505	5063	508	7394	7694	7692	891	9512	Frequency	Distribution
1978 - 1979	--	--	1	1	3	--	--	3	--	--	--	2	--	10	9.7%
1975 - 1977	--	--	--	--	2	--	--	4	--	--	--	--	--	6	5.8
1970 - 1974	--	--	--	--	2	--	2	6	1	2	2	2	2	17	16.5
1960 - 1969	3	--	1	--	2	1	3	7	--	2	2	7	--	26	25.2
1950 - 1959	2	2	1	--	3	--	1	7	--	1	1	1	--	18	17.5
Before 1950	<u>1</u>	<u>--</u>	<u>2</u>	<u>1</u>	<u>4</u>	<u>1</u>	<u>1</u>	<u>10</u>	<u>2</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>2</u>	<u>26</u>	<u>25.2</u>
Total	6	2	5	2	16	2	7	37	3	6	6	13	4	103	99.9%

2a. Is the business locally owned, a regional, or national firm?

<u>Ownership</u>																
Locally Owned	5	0	4	1	12	1	3	24	3	3	9	0	0	65	63.1%	
Regionally Owned	1	0	0	1	1	1	1	7	0	0	3	0	0	15	14.6	
National Firm	0	2	0	0	3	0	3	6	0	2	0	0	1	17	16.5	
Government	0	0	0	0	0	0	0	0	0	0	0	0	3	3	2.9	
No Response	<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>3</u>	<u>3</u>	<u>2.9</u>	
Total	6	2	5	2	16	2	7	37	3	6	13	4	4	103	100.0%	

3. How many persons do you employ, including yourself?

Coal Related Industry Growth By SIC Code	Number Of Firms Interviewed	Full Time Employment- Interviewed	Total Employment In Industry, 1979 *	Percent of Total Employment Interviewed
154 and 162	6	319	477	66.9%
291	2	520	797	65.2
344	5	325	330	98.5
451	2	130	165	78.8
501	16	385	615	62.6
505	2	65	68	95.6
5063	7	65	106	61.3
508	37	1,122	1,486	75.5
7394	3	35	38	92.1
7692 and 7694	6	67	90	71.1
891	13	464	505	91.9
7391 and 9512	4	286	361	79.2
Total	103	3,783	4,827	78.4%

*Montana Employment Security Division, unpublished employment data by three and four digit SIC Code.

3a. On the average, how many employees have you increased or decreased per year since 1970?

Number of Employees	Coal Related Industry Group by SIC Code													Total All Firms	
	154	162	291	344	451	501	505	5063	508	7394	7692	7694	891	7391	Frequency Distribution
0 or Decreasing	2	2	2	2	0	3	0	2	9	1	1	0	0	22	21.4%
Increased															
1 - 2	0	0	0	0	1	8	0	5	14	2	4	7	2	43	41.7
3 - 4	2	0	0	1	0	1	1	0	6	0	1	1	1	14	13.6
5 - 10	1	0	0	2	0	0	1	0	3	0	0	3	0	10	9.7
11 and Over	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No Response	1	0	0	0	1	4	0	0	5	0	0	2	13	14	13.6
Total	6	2	2	5	2	16	2	7	37	3	6	13	4	103	100.0%

4. What is the primary geographic market area that your company serves?

Geographical Areas																
Montana	3	0	0	0	0	3	0	1	5	0	2	0	3	17	16.5%	
Montana and Wyoming	2	0	3	1	6	6	2	4	23	2	3	4	0	50	48.5	
Montana, Wyoming and Western Dakotas	1	1	1	1	1	6	0	1	7	1	1	4	0	24	23.3	
Western United States	0	1	1	0	1	1	0	1	1	0	0	5	0	10	9.7	
No Response	0	0	0	0	0	0	0	0	1	0	0	0	1	2	1.9	
Total	6	2	5	2	2	16	2	7	37	3	6	13	4	103	99.9%	

5. What percentage of your business would you estimate, is with Billings and Yellowstone County residents or businesses?

Percentage	Coal Related Industry Group by SIC Code														Total All Firms	
	154 162	291	344	451	501	505	5063	508	7394	7692 7694	891	9512	7391 9512	Frequency Distribution		
0 - 9%	--	1	2	--	--	--	--	4	--	--	2	3	3	12	11.7%	
10 - 19%	2	1	1	1	4	1	--	9	--	--	4	1	1	24	23.3	
20 - 29%	--	--	--	--	--	--	1	9	--	--	2	--	--	12	11.7	
30 - 49%	1	--	1	--	3	1	3	6	--	2	2	--	--	19	18.4	
50 - 100%	3	--	1	1	9	--	2	8	3	4	3	--	--	34	33.0	
No Response	--	--	--	--	--	--	1	1	--	--	--	--	--	2	1.9	
Total	6	2	5	2	16	2	7	37	3	6	13	4	4	103	100.0%	

Average Percent
of Business in
Yellowstone County*

28.2% 10.0 15.1 32.5 49.0 19.2 34.8 23.3 57.7 61.9 28.3 8.0 -- --

*In this and future calculations of Industry Group average percents, firm responses were weighted average in accordance with the number of employees in each firm.

5a. What percent of your business is with out-of-state residents or businesses?

Percentage	Coal Related Industry Group by SIC Code														Total All Firms	
	154	162	291	344	451	501	505	5063	508	7394	7692	7694	891	9512	Frequency	Distribution
0 - 9%	2	--	--	--	--	3	--	3	4	--	3	3	2	1	18	17.5%
10 - 19%	--	--	--	2	--	1	--	--	8	1	3	3	2	--	17	16.5
20 - 29%	2	--	--	--	--	4	2	1	10	1	--	--	3	--	23	22.3
30 - 49%	1	--	--	2	2	5	--	1	9	--	--	--	--	1	21	20.4
50 and Over	1	2	1	--	--	2	--	1	4	--	--	--	6	1	18	17.5
No Response	--	--	--	--	--	<u>1</u>	--	<u>1</u>	<u>2</u>	<u>1</u>	--	--	--	<u>1</u>	<u>6</u>	<u>5.8</u>
Total	6	2	2	5	2	16	2	7	37	3	6	6	13	4	103	100.0%

Average Percent
of Business
Out-of-State

37.7% 90.0 41.8 40.0 21.9 20.0 15.9 20.5 21.4. 8.0 36.6 48.2

-- --

6. What percentage of your business would you estimate, is conducted directly with coal companies or coal related firms?

Percentage	Coal Related Industry Group by SIC Code															Total All Firms	
	154	162	291	344	451	501	505	5063	508	7394	7692	7694	891	9512	7391	Frequency	Distribution
0%	3	--	--	--	--	4	--	1	6	--	1	4	4	--	--	19	18.4%
1 - 10%	1	2	3	3	1	8	--	4	10	2	3	2	2	2	--	38	36.9
11 - 20%	1	--	--	1	--	3	2	1	7	--	--	--	2	--	--	17	16.5
21 - 50%	1	--	--	1	--	--	--	--	9	--	2	4	4	--	--	17	16.5
51% and Over	--	--	--	--	1	1	--	--	5	1	--	1	1	2	--	11	10.7
No Response	--	--	--	--	--	--	--	1	--	--	--	--	--	--	--	1	1.0
Total	6	2	2	5	2	16	2	7	37	3	6	13	4	4	103	100.0%	

Average Percent of Business Related to Coal

21.0% 5.0 12.7 27.5 7.5 20.2 6.1 22.5 29.9 24.3 22.7 13.9

--

6a. Location of direct coal related business by geographic area: (Multiple Responses).

Geographical Area	Coal Related Industry Group by SIC Code												Total All Responses	
	154 162	291	344	451	501	505	5063	508	7394	7692 7694	891	7391 9512	Frequency Distribution	
Colstrip	4	1	3	5	18	4	9	63	5	10	10	2	134	130.1%
Decker	1	1	3	1	8	3	7	33	1	4	3	2	67	65.0
Sheridan	--	--	--	--	2	--	3	8	--	1	2	--	16	15.5
Gillette	--	1	4	--	2	1	2	16	--	--	3	--	29	28.2
Other	--	1	--	--	1	--	2	7	--	1	5	2	19	18.4
No Coal Related Businesses	3	--	--	--	4	--	1	6	--	1	4	--	19	18.4
Total	8	4	10	6	35	8	24	133	6	17	27	6	284	275.6%

Average percentage of coal related business (sales volume) by geographic area.

Geographical Area	Coal Related Industry Group by SIC Code												Total All Responses	
	154 162	291	344	451	501	505	5063	508	7394	7692 7694	891	7391 9512	Frequency Distribution	
Colstrip	18.9%	2.0%	3.5%	15.0%	4.3%	6.7%	1.7%	8.5%	19.5%	21.1%	8.5%	4.6%	21.1%	4.6%
Decker	1.0	1.6	1.5	0.5	1.5	9.0	2.9	7.4	5.8	2.1	2.2	5.7	2.1	5.7
Sheridan	0.0	0.2	0.0	0.0	0.4	0.0	0.8	0.6	0.0	0.6	0.1	0.7	0.6	0.7
Gillette	0.0	0.2	0.8	0.0	0.2	2.3	0.0	1.0	0.0	0.0	0.0	0.7	0.0	0.7
Other	1.1	1.0	6.9	12.0	0.8	2.2	0.7	5.0	4.6	0.5	11.9	2.2	0.5	2.2
Total Coal Related Business	21.0%	5.0%	12.7%	27.5%	7.2%	20.2%	6.1%	22.5%	29.9%	24.3%	22.7%	13.9%	24.3%	13.9%

6b. What year did your direct coal related business begin?

Year	Coal Related Industry Group by SIC Code												Total All Firms
	154 162	291	344	451	501	505	5063	508	7394	7692 7694	891	7391 9512	
1978 - 1979	--	1	--	1	2	--	--	6	--	1	3	--	14
1976 - 1977	1	--	1	--	3	--	--	2	--	--	1	1	9
1974 - 1975	--	1	1	--	1	1	1	4	--	--	1	1	11
1972 - 1973	1	--	1	1	2	1	--	5	--	--	1	--	12
1970 - 1971	--	--	1	--	--	--	2	3	--	2	2	--	10
1965 - 1969	1	--	--	--	1	--	1	3	1	--	1	--	8
1960 - 1964	--	--	--	--	--	--	--	--	--	--	--	--	--
Before 1960	--	--	--	--	--	--	--	1	--	--	--	1	2
No Coal Related Business	3	--	--	--	3	--	1	7	--	1	--	1	16
No Response	--	--	1	--	4	--	2	6	2	2	3	--	21
Total	6	2	5	2	16	2	7	37	3	6	13	4	103

Frequency Distribution

13.6%

15.5

20.4

100.0%

6c. What has been the overall growth trend in your coal related business since it began?

Trend													
Rapid Increase	--	1	1	2	1	--	--	7	--	--	2	--	14
Steady Increase	2	1	2	--	8	--	4	13	--	2	3	3	38
Fluctuates	--	--	--	--	--	1	--	7	1	2	3	1	15
Decreased	--	--	--	--	--	--	--	--	--	--	--	--	--
No Change	--	--	1	--	3	--	1	--	2	--	1	--	8
No Coal Related Business	3	--	--	--	3	--	1	7	--	1	4	--	19
No Response	1	--	1	--	1	1	1	3	--	1	--	--	9
Total	6	2	5	2	16	2	7	37	3	6	13	4	103

13.6%

36.9

14.6

--

7.8

18.4

8.7

100.0%

6d. What has been your average annual increase in coal sales since it began?

Percentage	Coal Related Industry Group by SIC Code												Total All Firms	
	154 162	291	344	451	501	505	5063	508	7394	7694	891	9512	Frequency Distribution	
0%	--	--	1	--	1	--	1	--	1	--	--	--	4	3.9%
1 - 5%	--	--	--	--	5	--	2	5	--	--	--	--	12	11.7
6 - 10%	--	--	--	--	--	--	--	3	--	1	1	--	5	4.9
11 - 20%	1	--	--	1	2	--	--	6	--	--	2	--	12	11.7
Over 20%	--	1	--	1	--	--	--	2	--	--	1	--	5	4.9
No Coal Related Business	3	--	--	--	3	--	1	7	--	1	4	--	19	18.4
Don't Know/ No Response	2	1	4	--	5	2	3	14	2	4	5	4	46	44.7
Total	6	2	5	2	16	2	7	37	3	6	13	4	103	100.2%

6e. Has the geographic locations of your coal related business changed?

Response															
No	2	2	5	--	8	1	3	11	1	--	4	1	38	36.9%	
Yes	1	--	--	2	--	--	2	11	1	--	5	2	24	23.3	
No Coal Related Business	3	--	--	--	4	--	1	6	--	1	4	--	19	18.4	
No Response	--	--	--	--	4	1	1	9	1	5	--	1	22	21.4	
Total	6	2	5	2	16	2	7	37	3	6	13	4	103	100.0%	

If yes, new areas of service.

Northern Wyoming	--	--	--	--	--	--	1	3	1	--	1	--	6	5.8%	
Southern Montana	--	--	--	2	--	--	--	6	--	--	4	2	14	13.6	
Other	1	--	--	--	--	--	1	2	--	--	--	--	4	3.9	
Total	1	--	--	2	--	--	2	11	1	--	5	2	24	23.3%	

7. If no direct coal related business, do you anticipate or plan to promote any direct coal related business in the future?

	Coal Related Industry Group by SIC Code												Total All Firms
	154 162	291	344	451	501	505	5063	508	7394	7692 7694	891	9512	
Response													
Yes	2	--	--	--	1	--	1	1	--	--	2	--	7 6.8%
No	1	--	--	--	3	--	--	5	--	1	1	--	11 10.7
Coal Related Business	3	2	5	2	12	2	6	31	3	5	9	4	84 81.6
Don't Know/ No Response	--	--	--	--	--	--	--	--	--	--	1	--	1 1.0
Total	6	2	5	2	16	2	7	37	3	6	13	4	103 100.1%

8. Was the influence of the coal mining industry in the Billings area and/or outlying surrounding areas a consideration in your decision to open or locate here?

	Coal Related Industry Group by SIC Code													Total All Firms		
	154	162	291	344	451	501	505	5063	508	7394	7692	7694	891	9512	Frequency	Distribution
Response																
Yes, Directly	--	--	1	--	--	3	1	--	9	--	1	1	1	2	18	17.5%
Only in the Sense of General Growth Prospects	1	--	--	1	1	2	1	2	2	--	1	4	2	2	17	16.5
No*	5	5	1	4	1	11	--	5	26	3	4	8	--	--	68	66.0
Total	6	6	2	5	2	16	2	7	37	3	6	13	4	4	103	100.0%

*The majority of the firms that responded "No" to the question were established before regional coal development began.

9. Besides sales volume or personnel considerations, has regional coal development had any other effects on your organization?

	Coal Related Industry Group by SIC Code															Total All Firms	
	154 162	291	344	451	501	505	5063	508	7394	7692 7694	891	9512	Frequency Distribution				
Loss of Labor to Coal Mines	1	--	2	--	1	2	--	2	--	1	1	--	10	9.7%			
Addition of New Products or Services	1	2	--	2	5	--	2	12	1	--	4	--	29	28.2			
Training of Personnel	--	--	--	--	--	--	--	6	--	1	1	--	8	7.8			
Higher Wages	1	--	--	--	--	--	--	--	--	--	--	--	1	1.0			
No Effect	3	--	3	--	8	--	4	17	1	4	7	1	48	46.6			
Other	--	--	--	--	1	--	--	--	--	--	--	--	1	1.0			
No Response	--	--	--	--	1	--	1	--	1	--	--	3	6	5.8			
Total	6	2	5	2	16	2	7	37	3	6	13	4	103	100.1%			

10. Looking ahead, what future impacts if any, do you anticipate upon the Billings area as a result of coal development? (Multiple Response)

Response	Coal Related Industry Group by SIC Code													Total All Responses	
	154	162	291	344	451	501	505	5063	508	7394	7692	7694	891	7391	9512
No Impact	--	--	--	--	--	3	--	--	2	--	--	--	--	5	4.9%
Moderate Increase in Population	5	2	2	2	2	9	1	3	22	2	4	10	2	64	62.1
Moderate Increase in Economic Growth of the Area	4	--	2	2	1	10	--	4	19	2	4	7	--	53	51.5
Significant Increase in Population	1	--	2	2	--	2	1	2	9	--	1	2	--	20	19.4
Significant Increase in Economic Growth of the Area	1	2	3	--	--	1	2	1	8	1	--	4	2	25	24.3
Other	1	--	3	--	--	1	--	1	2	--	--	2	1	11	10.7
No Response	--	--	--	--	--	--	--	--	2	--	--	--	1	3	2.9
Total	12	4	12	3	3	26	4	11	64	5	9	25	6	181	175.8%

10a. Looking ahead, what future impacts if any, do you anticipate upon your operations as a result of coal development?

	Coal Related Industry Group by SIC Code												Total All Responses
	154 162	291	344	451	501	505	5063	508	7394	7692 7694	891	9512	Frequency Distribution
No Impact	--	--	--	--	3	--	--	--	--	--	--	--	3 2.9%
Stayed Pretty Much the Same	--	--	--	1	5	--	1	7	2	--	1	2	19 18.4
Increase Sales Volume	4	2	5	1	6	2	6	28	1	4	8	1	68 66.0
Increase Personnel	2	1	2	1	3	1	2	14	--	2	7	1	36 35.0
Expansion of Facilities	2	1	1	1	2	1	1	7	1	3	3	--	23 22.3
Addition of New Products or Services	1	1	--	1	4	--	3	11	--	--	1	--	22 21.4
Dependent on Whether the Coal Development Will Pick Up	--	1	--	--	--	--	--	2	--	1	3	--	7 6.8
Other	1	--	--	--	--	--	--	2	--	1	1	--	5 4.9
No Response	--	--	--	--	--	--	--	--	--	--	--	--	1 1.0
Total	10	6	8	5	24	4	13	71	4	11	24	4	184 178.7%

11. On the whole, has regional coal development had a positive, neutral or negative influence on your organization? On the Billings area?

All Coal Related Firms Interviewed

Response	Your Organization		Billings	
	Frequency	Distribution	Frequency	Distribution
Positive	91	88.3%	88	85.4%
Negative	1	1.0	1	1.0
Neutral	11	10.7	13	12.6
No Response	--	--	1	1.0
Total	103	100.0%	103	100.0%

12. General Observations/Suggestions/Comments? (Multiple Responses). All Coal Related Firms Interviewed

Response	Frequency	Distribution
Coal Development will not have that large of an impact on the Billings area.	6	5.8%
State Excise Tax is severely hindering present and future coal development	23	22.3
Larger National firms are moving into Billings and buying out the smaller competitor.	5	4.9
Coal Development will protect Billings from adverse economic downturns	16	15.5
No Comment	33	32.0
Other	44	42.7
Total	127	123.2%

EXHIBIT A-1.
Interview Guide

Name of Business _____

Name and Position of Respondent _____

General Location/Address _____

1. Type of Organization:

- | | |
|---|--|
| <input type="checkbox"/> Retail | <input type="checkbox"/> Transportation, Communication and Utilities |
| <input type="checkbox"/> Service | <input type="checkbox"/> Construction |
| <input type="checkbox"/> Manufacturing | <input type="checkbox"/> Wholesale |
| <input type="checkbox"/> Finance, Insurance and Real Estate | <input type="checkbox"/> Government (State, Federal) |
| <input type="checkbox"/> Agriculture | |
| <input type="checkbox"/> Mining | |

1a. SIC (4 Digit) _____ (Add Later)

1b. Year Established _____

2. Description of business: What exactly does the business do?

2a. Is the business locally owned or a regional firm? _____

3. How many persons do you employ, including yourself?

- a. Summer _____ Full Time
- b. Winter _____ Full Time

3b. On the average, how many employees have you increased or decreased per year since 1970 (modify if necessary)? _____

4. What is the primary geographic market area that your company serves?

5. What percentage of your business would you estimate is with Billings and Yellowstone County residents or businesses? _____

- 5a. What percent is with out-of-state residents or businesses? _____

6. What percentage of your business would you estimate is conducted directly with coal companies or coal related firms? _____

(If none, go to question 7.)

- 6a. If any, seek:

<u>Name/Location</u>	<u>Percent of Total Sales/Volume</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

- 6b. What year did your direct coal related business begin? _____

- 6c. What has been the overall growth trend in your coal related business since it began?

Trend

Rapid Increase _____
 Steady Increase _____
 Fluctuates _____
 Decreased _____
 No Change _____
 Why? _____

- 6d. What has been your annual average percent increase in coal sales since it began? _____

- 6e. Has the geographic locations of your coal related business changed?

- 6f. For the service you provide to coal companies, are you competing with other businesses not located in Billings. If yes, where are they from?-- Percent of local market they command. _____

Do you anticipate that these competitors will eventually locate here?

_____ Yes _____ No _____ Don't Know

(Go to Question 8.)

7. If none, do you anticipate or plan to promote, any coal related business in the future?

_____ Yes _____ No

Why? _____

8. Was the influence of the coal mining industry in the Billings area and/or outlying surrounding areas a consideration in your decision to open or locate here?

Yes, directly _____

Only in the sense of general growth prospects _____

No _____

Why? _____

9. Besides sales volume or personnel considerations, has regional coal development had any other effects on your organization? (Describe) (ex. competition from outside firms, addition of new products or services, education of personnel, vandalism).

10. Looking ahead what future impacts if any, do you anticipate upon the Billings area as a result of coal development?

No Impact _____
 Moderate Increase in Population _____
 Moderate Increase in Economic
 Growth of the Area _____
 Significant Increase in Population _____
 Significant Increase in Economic
 Growth of the Area _____
 Other _____

- 10a. Looking ahead, what future impacts, if any, do you anticipate upon your operations as a result of coal development?

No Impact _____
 Stayed Pretty Much the Same _____
 Increase Sales Volume _____
 Increase Personnel _____
 Expansion of Facilities _____
 Addition of New Products
 or Services _____
 Dependent on whether the
 Coal Development will pick up _____
 Other _____

11. On the whole, has regional coal development had a positive, neutral or negative influence on your organization on the Billings area?

	<u>Your Organization</u>	<u>Billings</u>
Positive	_____	_____
Neutral	_____	_____
Negative	_____	_____

12. General Observations/Suggestions/Comments?

State Excise Tax is severely hindering present and
future coal development _____

Coal Development will not have that large of an impact
on the Billings area. _____

Larger National firms are moving into Billings and
buying out the smaller competitor. _____

Coal Development will Protect Billings from adverse
economic downturns _____

No Comment _____

Other _____

EXHIBIT A-2.
BILLINGS URBAN AREA
LIST OF FIRMS INTERVIEWED

Agriculture

Billings Grain Terminal
Farmer's Union Grain Terminal Association
Bowman Grain & Seed Company

Construction

Ramsey Construction and Fabricating Company, Inc.
Hanson-Kelley Construction, Inc.
Long Construction-United Industries, Inc.
Hardy Construction
Lloyd Lockrem Construction, Inc.
Spildie Construction Company

Manufacturing

Exxon Company
Conoco, Inc.
Industrial Plating & Grinding Company
Pierce Packing Company
Reliable Tent & Awning Company
Holland Loader Company
Ideal Manufacturing, Inc.
Boise Cascade (Laurel)
Beall, Inc.
Marketing, Manufacturing Division of Building Specialties
Ryniker Steel Products Company
Rosco Steel & Culvert Company
Empire Steel Manufacturing Company

Transportation, Communication and Public Utilities

Lynch Flying Service, Inc.
Big Sky Airlines
Montana-Dakota Utilities Company
Montana Power, Electric Service Division
Anderson Ellerding Travel Service
M & S Travel
Northern Tank Line
Mountain Bell
Rice Truck Lines
Trans System, Inc.
Matlack, Inc.
H. F. Johnson
United Van Lines Agency
Bekins Van Lines Agency

Consolidated Freightways General Commodities Freight Terminal
 Salt Creek Freightways
 HI-Ball Trucking
 Garrett Freight Lines
 Burlington Northern, Inc.

Wholesale and Retail Trade

Modern Machinery
 T & E Company
 Tri-State Equipment, Inc.
 Westmart Tractor Company
 Midland Materials
 H & C Oil Company
 Westchem Agriculture Chemicals, Inc.
 Dyce Sales & Engineering Service Company
 Pelican Oil Company
 Walters, Inc.
 Moore Business Forms
 Northwest Electric, Inc.
 Thik 'N' Thin Building Materials
 Georgia-Pacific Corporation
 Associated Food Stores
 Van Waters & Rogers
 PPG Industries Glass Service
 Mountain States Petroleum Corporation
 Western Paper Company
 Macon Supply, Inc.
 Quality Concrete Company
 Wyo-Ben Supply
 Powder River Explosives
 Western Builders Supply Company
 Winter Hardware Company
 Safeway Supply, Inc.
 Fasteners, Inc.
 Byron Epp Company
 Western Pump & Meter
 Mineco, Inc.
 Marion Power Shovel Division of Dresser Industries Corporation
 Hall-Perry Machinery Company
 Bearings, Inc.
 Northwest Industrial Supply
 Bearings Supply Company
 Carl Weissman & Sons, Inc.
 O'-M Equipment Company
 Great Northern Tool & Supply Company
 Power Transmission Equipment
 HR Oxygen & Supply Company
 Crown Parts & Machine
 Valley Welding & Supply
 Yellowstone Hydraulics
 Holeman G.M. Diesel, Inc.
 Pacific Steel
 Northwest Pipe Fittings, Inc.

Northland Steel Division
Allis Chambers Industrial Equipment
Computer Chip & Supply
John Deere Farm Machinery Agency
Safety & Fire Equipment Distributing Company
Henry's Safety Supply
Burroughs Corporation
ITT Grinnell
Western Equipment Company
Cardinal Northwest, Inc.
D & D Parts & Equipment
Marketing Specialties and Manufacturing
O'Donnell Fire Service
Buffalo Machinery Company
Cummins XL, Inc.
Petrolane Midland Gas Service
Buttrey Usco Family Center
Country Kitchen
Husky Parkway Services (West)
Billings Cycle Center
Denver Dry Goods Company
Freedom Homes, Inc.
State Optical, Inc.
TSC Stores
Pierce Mobile Homes
Char-El Mobile Homes Corporation
Reporter, Inc.
Corral West Ranchwear
Schrader Stoves of Billings
Radio Shack
House of Fabrics
Kinney Shoes
Frontier Chevrolet Company
Ryan AMC Dealer
Town & Country GMC
Ziegler Lumber Company
Knox Lumber Company
Aldrich & Company
Graybar Electric Company, Inc.
W. W. Granger, Inc.
C. W. Wolfe Electronics
General Electric Supply Company
Westinghouse Electric Supply Company
Industrial Electronics & Automation Company
Johnstone Supply Company
Brad Ragan, Inc.
Northwestern Auto Supply Company
Motor Power Equipment Company
International Trucks
Freightliner Trucks
Yellowstone Ford Truck Sales, Inc.
Peterbilt Motor Trucks
Interstate Tire Treads, Inc.
Standard Parts & Equipment Company, Inc.

Hines Motor Supply (two stores)
 Motor Parts Warehouse Company
 Mountain Motor Supply
 United Glass
 Inland Truck Parts Company
 Tire-Rama
 Montana Steel & Supply Division of Egger Steel Company
 Building Specialties, Inc.

Finance, Insurance and Real Estate

Streeter Brothers
 Century 21 Properties, Inc.
 Toole & Easter
 Security Bank, N.A.
 First Northwestern National Bank
 Montana Bank of Billings

Service

Crowley, Haughey, Hanson, Toole & Dietrich
 Eastern Montana State College
 Saint Vincent Hospital
 Montana Brake Engineering, Inc.
 Magic City Mack, Inc.
 Midland Printing
 Brown's Auto Service
 Artcraft Printers
 Avis Rent A Car
 Big Sky Linen Supply
 Hertz Rent-A-Car Licensee
 Galusha, Higgins & Galusha
 Holiday Inn
 Northern Hotel-Best Western
 Ramada Inn
 Commercial Testing & Engineering Company
 Strong's Crane Service
 American Rent-All
 Montana Powder & Equipment Company
 Wirth & Associates
 Sanderson, Stewart & Mueller Engineering, Inc.
 Geo West, Inc.
 Associated Surveys, Inc.
 Northern Testing Laboratories
 Morrison-Maierle, Inc.
 CTA Architects Engineers
 Christian-Spring-Sielbach & Associates
 Johnson-Graham Associates Architects-Engineers-Planners
 Schmit Smith & Rush
 HKM Associates
 Con'eer Engineering, Inc.
 Energy Laboratory
 Weber's Machine & Welding
 Frank's Welding & Machine

Westinghouse Electric Corporation Apparatus Service
Hall Machine Company, Inc.
General Electric Company Apparatus Service
Billings Machine & Welding Shop

Public Administration

U.S. Geological Survey
Department of State Lands
Fish & Wildlife Department
Bureau of Land Management
Bureau of Indian Affairs

Note: Five coal mining organizations were also interviewed. Since the purpose of these interviews varied from those conducted with the above businesses, they are excluded from this list. Likewise, a number of local government bodies were interviewed.

APPENDIX B
SAINT VINCENT HOSPITAL SURVEY

A review of approximately 600 Saint Vincent Hospital inpatient files was conducted during February 1980. The purpose of this survey was to determine the hospital's geographic service area and to measure the present indirect impact of regional coal development on the hospital. Saint Vincent Hospital was selected for the survey because of its role in the region as well as being a major employer in the community.

Table B-1 illustrates the geographic distribution of the patients surveyed. The majority of Saint Vincent patients reside in Billings. The remaining patients surveyed resided in several communities, primarily concentrated in southeastern Montana and northern Wyoming. Approximately eight percent of the patients using the hospital facilities are from outside the State of Montana.

Table B-2 sets forth the number of patients and guarantors surveyed who are employed by coal companies or coal related firms. Ten patients, or 1.67 percent of the sample size, are employed by coal related firms. This indicates that approximately two percent of Saint Vincent's patients are directly attributable to coal development in the surrounding area. The number of patients a hospital administers generally relates to the approximate number of employees needed to serve those patients. Survey results suggest that about 15 employees of Saint Vincent's employment (750 employees) are attributable to area coal development.

TABLE B-1. GEOGRAPHIC DISTRIBUTION OF PATIENTS AT
SAINT VINCENT HOSPITAL

City of Residence	Frequency	Distribution
Billings	311	51.9%
Laurel	20	3.3
Roundup	13	2.2
Glendive	12	2.0
Powell, Wyoming	11	1.8
Forsyth	9	1.5
Hardin	8	1.3
Colstrip	8	1.3
Crow Agency	8	1.3
Miles City	8	1.3
Red Lodge	7	1.2
Worden	7	1.2
Lame Deer	7	1.2
Wordland, Wyoming	6	1.0
Lovell	6	1.0
Joliet	6	1.0
Sheridan, Wyoming	6	1.0
Cody, Wyoming	6	1.0
Other Montana Cities*	119	19.9
Other Out-of-State Cities*	<u>21</u>	<u>3.5</u>
Total**	599	99.9%

*Communities mentioned in the categories of Other Montana Cities and Other Out-of-State Cities represented less than one percent of the hospital's geographic service area.

**Total does not add to 100 percent because of rounding.

Source: Inpatient files, 0 to 90 days, with Saint Vincent Hospital for August 1, 1979 through January 31, 1980, listings A through B.

TABLE B-2. COAL-RELATED PATIENTS AND PATIENT'S GUARANTOR
AT SAINT VINCENT HOSPITAL

Patient and Guarantor (PG) or Guarantor Only (G)	City of Residence	Sex	Patient's or Guarantor's Employer	Patient's or Guarantor's Occupation
PG	Colstrip	M	Long Construction	Unknown
PG	Colstrip	M	Long Construction	Mine Foreman
G	Colstrip	M	Long Construction	Electric Foreman
G	Colstrip	M	Long Construction	Service Oiler
PG	Hardin	M	Morrison-Knudsen	Heavy Equipment Operator
G	Hardin	M	Morrison-Knudsen	Crane Operator
G	Hardin	M	Morrison-Knudsen	Heavy Equipment Operator
PG	Ashland	M	Peabody Coal	Oiler
PG	Forsyth	M	Peabody Coal	Miner
G	Gillette	M	AMAX Coal	Maintenance Supervisor

Source: Inpatient files, 0 to 90 days, with Saint Vincent Hospital for August 1, 1979 through January 31, 1980, listings A through B.

APPENDIX C

BILLINGS REVENUES, EXPENDITURES AND PROVISION OF CITY SERVICES

In order to evaluate the effect of population growth on the city's prospects for financial stability, past city budgets, sources of revenue, and historical expenditure trends were examined. In addition, interviews with local officials were conducted to determine present service levels and future capital requirements. This appendix provides certain background material related to these investigations that was applied in developing the assumptions and conclusions drawn in Section IV. State and local revenue sources are detailed, past city expenditures by function are examined, and present and future service levels described.

Sources of Revenue--State

In fiscal year 1978, the State of Montana collected over \$270 million in taxes and fees. Approximately 46 percent of this revenue came from personal income taxes, 14 percent from gasoline taxes and 12 percent from coal license and severance taxes. Most revenues accrue to the state's general fund, while certain revenues are earmarked for particular expenditures including redistribution to the state's cities, towns and counties. Montana is unusual in two aspects of its financing and taxation system. The state remains one of five states with no general retail tax. This results in an unusually large dependence on income and property taxes. Additionally, Montana has large reserves of natural resources, the extraction of which generates a growing portion of the state's revenue. Both of these characteristics have financial implications for the City of Billings, which are discussed in Section IV. The following taxes represent the state's primary sources of revenue. Taxes earmarked for local governments are emphasized.

Personal income tax. The personal income tax in Montana is administered in a manner similar to that used in most states, and closely parallels the federal system. Gross adjusted income is used to determine a taxable rate for individuals and corporations. All revenues accrue to the state but a portion of these collections (25 percent) are earmarked for the Montana School Foundation Fund which is redistributed to local school districts.

Highway user fees. These vehicle and highway related fees include fuel taxes, vehicle registration fees and several special user and permit fees. Property taxes are also levied against motor vehicles. Most highway related taxes go toward the development and maintenance of the state's road and highway system. A portion of this money is made available to local governments for road construction. Specifically, tax collections are allocated each year to the state's cities, towns and counties according to each district's population and road mileage. Vehicle registration fees after deducting licensing costs are also distributed to local road funds according to the number of vehicles registered in each county. These distributions must be used exclusively for road construction and maintenance.

Other highway user taxes such as driver license fees, temporary permits, etc. are primarily regulatory mechanisms and generate only sufficient revenues to maintain operations.

Alcoholic beverage tax. The Montana Liquor Control Board is responsible for all wholesaling of liquor within the state. Profits from the operation of the liquor board, and revenues from the 16 percent excise tax on retail sales of wine and spirits, accrue to the state general fund. Local governments receive revenue from the state beer tax according to a population distribution formula, and revenues from the state liquor license tax in proportion to the amount of liquor sold by state licensed stores in each county.

Mineral resources taxes. The State of Montana levies a severance tax on the extraction of coal, oil and gas and various minerals. With the exception of the coal tax, revenues from mineral extractions taxes are earmarked for the state general fund. Coal severance tax revenues are distributed to a number of specific funds including the coal trust fund, the school equalization fund and the state general fund, which together absorb approximately 75 percent of total severance tax collections.

The Montana Coal Board oversees the distribution of severance tax revenues accruing to the local impact and education fund. These amount to approximately 18.75 percent of all coal tax collections. Awards are made to counties, towns and school districts for infrastructure improvements based on need, severity of impact, availability of funds and local effort.

Property tax. Collections from property tax account for approximately one-half of Montana's total state and local tax revenues. By law all Montana property is assessed at full market value. In actuality, assessed value tends to lag considerably behind real market value.

Taxable property value in most instances represents a small portion of market value. Real property in Montana is classified for tax purposes into one of 19 categories, with each category given a taxable value representing a defined percentage of market value. For instance, most residential property in Montana is given a taxable value equal to 8.5 percent of total market value. Other taxable valuations range from 100 percent to three percent of market value. The state collects only a small portion of its revenues from property taxes, primarily in the form of a six mill levy for support of the university system. None of the state's property tax revenue is earmarked for local government receipt.

Summary. Education expenditures excepted, local governments receive only limited financial support from the State of Montana. Most state resources are distributed on a per capita or a similar basis, or are earmarked for special use. Mineral related revenues available to local governments are either earmarked to special funds or redistributed to communities directly affected by coal development. Given present redistribution formulas, based primarily on per capita ratios, revenues coming to the City of Billings from the state will increase roughly in line with the city's population. If Montana is successful in maintaining its severance tax level in the face of opposition, and the state's economy continues to prosper, additional state distribution to financially strapped cities and towns might be forthcoming.

Sources of Revenue--Local

Table C-1 presents an aggregation of Billings city revenues by revenue source for fiscal years 1978-1980. In fiscal year 1980, local property tax including library assessments and personal property levies generated 45 percent of the city's general revenues. Included in general revenues are Federal revenue sharing, state transfer monies for street improvements and capital replacement monies designated for non-enterprise or non-utility operations. Property tax receipts including personal property and library assessments have remained steady over the past three years although delinquent taxes have risen.

Intergovernmental revenues, primarily transfer payments from the state for road construction and general operating expenses, represent the city's second largest revenue source. In 1980, Billings anticipated \$1.70 million from intergovernmental sources, or about 13 percent of total general revenues. This figure does not include one-time grants. Intergovernmental revenue has grown at an annual rate of approximately 14 percent since 1978 and as such represents an important although uncertain source of city funds.

Locally generated revenues, including license, permit and court fees, charges for non-utility services such as library operations and revenues from public works, account for \$2.7 million or about 21 percent of the city's anticipated 1980 operating revenues. These revenues have grown at an annual rate of 12 percent over the last two years, mainly the result of increased charges for city services.

Revenue sharing and special grant money received for general operating purposes represents an additional source of non-locally generated revenue. In 1980, these funds, originating almost entirely with the Federal Government, are anticipated to provide about 11 percent of the city's operating revenues. This category has grown by less than five percent per year since 1978. Given current pressures for reduced federal expenditures, future revenue prospects are uncertain.

Revenue from motor vehicle taxes will provide about three percent of Billings operating funds in 1980. Revenues from vehicle taxes declined sharply in 1980, the result of fewer car purchases than anticipated.

From all non-enterprise sources, the City of Billings anticipates generating approximately \$12.6 million of operating and capital revenues during fiscal year 1980. This represents a modest \$.27 million increase over 1979 and a \$1.06 million increase over 1978. In total, non-enterprise revenues for the city from all sources have risen at an annual average rate of 4.5 percent per year since 1978. The City of Billings has traditionally maintained a large cash reserve which remains in excess of \$11 million. This money is potentially available to cover operating shortfalls or unanticipated expenses.

In addition to general revenue sources, Billings generates considerable revenues from the operation of public utilities. These city functions, often referred to as enterprise funds, typically generate sufficient revenue to cover the costs of operations. Outstanding capital costs are covered through bonded indebtedness or grants. In Billings the water department, sanitary and storm sewage operation, public transit system and airport are operated as enterprise funds. In certain years these funds have required additional money from the general fund to maintain operations. In other years, Billings' utilities have generated excess revenue that has gone to support other city operations. In

TABLE C-1. CITY OF BILLINGS REVENUE GROWTH BY SOURCE (\$000's)*

Revenue Categories	Fiscal Years		
	1978	1979	1980
<u>General Revenues</u>			
Property tax including library and personal property taxes	\$ 5,530	\$ 5,680	\$ 5,681
Motor vehicle taxes	792	760	410
Court revenues	524	621	657
Licenses and permits	632	535	616
Charges for services	248	265	648
Public works revenue	728	914	748
Intergovernmental	1,300	1,422	1,700
Revenue sharing	880	954	853
Miscellaneous	225	167	671
Grants to non-enterprise activities	645	578	585
Subtotal	\$11,504	\$11,896	\$12,569
<u>Other Revenues</u>			
Enterprise funds	\$ 8,259	\$ 9,625	\$12,538
Grants to enterprise funds	5,951	4,168	17,882
Interest on investments	486	613	659
Sale of bonds	NA	NA	3,500
Beginning balance	NA	NA	12,072

*Budgeted revenue collections were used for fiscal years 1978 and 1979 and adjusted where actual collection data were available. Midyear estimates were used where available for 1980. Data are taken from City of Billings Budget Reports 1977-1979 and data provided by the City Clerk's Office, July 1980.

the past three years, the major utilities have operated successfully as enterprise ventures. All municipal water and sewer operations in Montana are regulated by the Montana Public Utilities Commission and rate hikes must receive PUC approval. In the past delays attendant to receiving this approval have caused temporary revenue shortfalls. Presently, the city's transit department requires transfer payments from the general fund to maintain recently expanded operations. In the future, the city will reduce services to a sustainable level or raise additional revenues through increased use charges or a new mill levy. Presently, revenues accruing to Billings enterprise funds approximates \$12.5 million annually. Revenue flow is projected to increase nearly 30 percent in 1980, due mainly to increased sewer and water charges and increased revenue from the Billings airport.

In addition to user fees, Billings utilities received substantial grant monies for capital expansion primarily from the Federal Government. The largest of these were for sewerage system expansion (\$8.98 million) and airport renovation (\$6.98 million). It is unlikely that Billings will continue to receive this high level of support on an annual basis.

Expenditures. Table C-2 provides a breakdown of city expenditures by operational category for the years 1978-1980. Expenditures for general operations are distinguished from enterprise operations. Capital outlays and remaining cash reserves are also shown separately.

The cost of general government in Billings has continued to increase in recent years despite manpower reductions, deferred expenditures and in some instances reduced service levels. The cost of general operations, which includes police, fire, administration, public works, library services and recreation, has risen approximately seven percent per year over the past two years. This increase occurred despite a concentrated effort to eliminate unnecessary or deferrable expenditures.

The operation and debt service expenditures related to enterprise activities have also climbed--over 12 percent per year since 1978. In addition, over \$26 million in new capital construction projects were begun or funded during the 1980 fiscal year. The majority of these capital expenditures were for airport improvements, water and sewer expansion, and the purchase of new buses for the Billings transit system.

Summary. Over the past three fiscal years, Billings expenditure growth has consistently outpaced new revenue generation. Based on these trends, an analysis of future revenue prospects and discussions with local officials forecasts of Billings general revenue and expenditure requirements are provided in Section IV.

TABLE C-2. CITY OF BILLINGS EXPENDITURES BY FUNCTION (\$000's)*

Expenditure Category	Fiscal Years		
	1978	1979	1980
<u>General Operations</u>			
General government	\$1,704	\$2,041	\$ 2,152
Law enforcement	3,105	3,039	3,094
Fire protection	2,139	2,527	2,590
Public works	4,067	3,487	4,526
Parks and recreation	763	751	969
Library	608	844	859
<u>Enterprise Operations and Debt Service</u>			
Water	\$3,114	\$3,419	3,522
Sanitary sewer	1,580	1,933	2,017
Storm sewer	333	344	452
Solid waste	1,663	1,613	1,808
Parking garage	216	199	230
Airport	753	1,169	1,246
Transit	336	673	884
Enterprise Operations Subtotal	\$7,995	\$9,350	\$10,159
Capital outlay for all enterprise funds	\$5,572	\$4,707	\$26,336
Cash reserves	NA	NA	\$ 9,210

*Actual expenditures were used as available for 1978 and 1979. Budgeted figures based on midyear revenues were used in 1980.

Billings City Operations

The following section reviews the condition of Billings' city services. Changes in service levels, future expenditure requirements and estimation of service adequacy are described.

Water System(30)

Supply. The City of Billings draws its raw water directly from the Yellowstone River as it passes the city's eastern boundary. After many years of controversy, water allocations on the Yellowstone are being reviewed by the Montana courts and a temporary moratorium has been placed on new water diversions. The city presently withdraws over 16,000 acre feet per year and claims further rights to nearly three times that amount. Even if the courts should reject a large portion of these claims, the city expects to have ample water supplies for foreseeable needs.

Treatment. The city's raw water supply contains a considerable amount of dissolved solids, organic material and calcium (hard water). The Billings' water treatment plant utilizes an oxidizing agent and chlorinator to neutralize organics and a coagulation and sedimentation process to remove dirt and dissolved solids. Billings has experienced no meaningful problems in meeting state and federal water quality standards.

The recently enlarged water treatment plant is capable of treating 75 million gallons per day (mgd) and a short duration peak load of 100 mgd. This should prove adequate for a service population of over 115,000 persons. With additional modest expenditures for pumping equipment this capacity could be increased by over 30 percent.

Distribution. The city's main distribution lines are generally in good condition although certain central city lines are old and in need of replacement. The city provides for maintenance and repair of existing facilities and has recently formulated a long term capital improvements schedule for renovation of deteriorated lines. The extension of water lines to new developments is the responsibility of the developer.

Usage. Treated water is provided to approximately 21,200 customers (1979). This figure includes large industrial consumers as well as four private water districts serving customers outside of the incorporated city.

According to a 1979 consultant's report, the number of water service customers has grown at an average annual rate of 2.1 percent over the past three fiscal years. This figure might understate actual growth because certain areas experiencing rapid population growth such as Billings Heights are billed as a single wholesale customer. Despite customer growth, water consumption has remained very stable over the past seven years. This per capita reduction in consumption is attributable to increased water rates, above average summer rainfall and strenuous conservation efforts on the part of a few large customers. In 1979, municipal water customers consumed approximately 6.5 million Ccf, of which 43 percent was consumed by city resident domestic use. Annual consumption in 1979 was down nine percent from consumption levels in 1972.

Future needs. The Black and Veatch water utility fiscal projections completed in 1979 presents forecasts of potential water revenues and expenditures associated with system maintenance, replacement and expansion over the next three years. Sales of treated water are projected to increase 1.5 percent annually. Given existing (1979) water rates, revenues will increase approximately 1.6 percent per annum. Total revenue requirements for the forecast period (fiscal years 1980-1982) including all expenses associated with system operation, maintenance, annual improvements and debt service are forecasted to fall short of anticipated revenues by \$3.27 million. As a result, the city has asked the Montana Public Utilities Commission for a 32 percent rate increase and has plans to float a \$3.5 million revenue bond. Revenues from the bond issue will provide for improvements at the treatment plant, a new pumping station and transmission line replacement in the Billings Heights area. Assuming PUC acceptance of the Billings rate adjustment increase and the successful sale of the proposed bond issue, the Billings water utility should be able to provide adequate service over the next three years. Long term financial requirements will also be met with rate increases and additional bonding.

Sewerage System(31)

Collection. The municipal waste water treatment system provides sewage collection and treatment services for approximately 19,450 in-city customers and 100 non-city residences. With the exception of these 100 non-resident customers, the City of Billings does not extend services beyond its incorporated limits.

The collection system is in good condition with only minor infiltration problems in the older sections of the city. The Billings Utilities Department has conducted regular system improvements, and all sections of clay pipe and most areas of inadequate sized trunk lines have been replaced. The existing system is gravity operated but supplemented with 12 lift stations. System improvements planned for fiscal year 1981 will consolidate six of these lift stations into one larger station thus reducing certain maintenance and capacity problems currently being experienced.

The Billings Heights and Lockwood areas have no community sewerage system, relying instead on private septic tanks and leach fields. A regional wastewater study, which examined the future treatment requirements for the Billings area, recommended that Billings Heights and Lockwood eventually be incorporated into the municipal service district. Such a development would require an enlargement of the present treatment plant or construction of an additional facility. Both Lockwood and Billings Heights are examining the possibility of developing local treatment plants.

Treatment. The Billings wastewater treatment plant has been enlarged twice since its original construction in 1948. The present activated sludge system has a design capacity of 22 million gallons per day, and the capability of serving 117,000 persons. Average daily flow in 1978 was slightly over 15 mgd, or about 70 percent of capacity. The Billings industrial waste contributors present certain treatment problems, although past plant overloading resulting from seasonal sugar refining activity has been reduced by pre-treatment.

A number of major capital construction projects related to the waste water collection system will be accomplished over the next three fiscal years.

Expenditures of \$13.5 million are planned including installation of a new interceptor line to serve the growing west side of the city, improvements at the treatment plant and consolidation of the existing lift stations into one major station. Nearly 75 percent of these costs will be met with Federal grants and additional sums are anticipated from developers of new subdivisions. According to a revenue analysis performed in 1979 by a engineering consulting firm, revenues accruing to the city from wastewater service charges, tap fees and outside sources should be adequate to provide for all expenses associated with operation maintenance, debt service, recurring capital improvements and planned major capital construction through fiscal year 1983.

Solid Waste Collection(32)

Municipal solid waste collection is the responsibility of the sanitation division of the Billings Public Works Department. Residential collection is provided on a twice weekly basis for all city residences and on an as needed basis for businesses and industry. The city operates a fleet of 28 collection trucks, 23 of which operate daily while the remaining vehicles are used on a temporary replacement basis. The division employs 67 persons including clerical and administrative personnel.

In addition to collection services the sanitation division operates and maintains the city's landfill. Situated just south of the Yellowstone River on a 572 acre site, the Billings landfill serves all of Yellowstone County and portions of Carbon and Big Horn Counties. The Town of Laurel also operates a small municipal landfill. Use of the Billings facility by non-city residents or any private companies is on a fee basis.

The sanitation department operates as an enterprise fund with revenues from user fees covering all costs of operations. Refuse collection rates for city residents were last raised in 1977. The present landfill site will be adequate for all anticipated growth over the next 20 years although additional capital improvements will be required. Specifically, a new compactor, additional grading and road maintenance equipment and enlarged fencing will be needed as revenue allows.

The division's vehicular fleet also needs upgrading. Trucks are now kept eight to 10 years where five to seven years is considered optimal. Annual replacements have been delayed; maintenance and operating costs on the existing trucks have increased considerably. A user rate increase will probably be required during fiscal year 1981 to ensure continued operation at present service levels and to generate revenue for necessary capital investment.

Fire Protection(33)

Fire protection service in the City of Billings is provided by the Billings Municipal Fire Department. Service in the outlying area is available through O'Donnell's Fire Service, a private concern that provides fire protection services on an individual contractual basis. The Town of Laurel, the two Billings oil refineries and the Billings International Airport also maintain private emergency fire fighting equipment and staff.

The Billings Fire Department employs 106 professional fire fighters and 11 clerical or technical persons. This represents a reduction of nine

workers from 1979, the result of budget constraints. Despite manpower reductions, fire protection services in the city have remained at an adequate level. In 1979, the Insurance Services Organization (ISO) raised the city's insurance rating from four to three, evidence of the community's successful attempt to improve protection services. This new rating reduced commercial insurance costs by approximately 10 percent.

The Billings Fire Department presently maintains six fire stations within the city's boundaries. The main station, which serves as the department's administration and communications center, is situated at 8th Avenue and 24th and serves the central business district and the older parts of the community. The city's five substations are dispersed throughout the city to minimize response delays. The development of substations has occurred intermittently, roughly following the growth of the city. The most recent addition, the Elmo Drive station, has reduced response time to the rapidly growing Alkali Creek and Kimberly Heights area. Additional substations, coupled with the consolidations of existing stations, will be required as Billings grows and as certain areas experience further urbanization.

The Billings Fire Department has a combined pumping capacity of approximately 12,500 gallons per minute, although certain equipment is old and only available for limited use. Generally, newer equipment is utilized on a day to day basis while older equipment is held in reserve for emergencies. One effect of recent budgetary cutbacks has been to delay the replacement of older equipment. If this situation continues, a deterioration in service provision and an increase in maintenance costs will occur.

Rural fire protection. O'Donnell Fire Service provides fire protection to subscribers residing in the unincorporated areas of Yellowstone County. O'Donnell presently maintains a main station and communications office in Billings and two substations in rural Yellowstone County. Additional stations in the Lockwood area and the Billings Westside are in the planning stages. Protection services provided through this arrangement are adequate although certain economies of scale that are available to public entities are lost to a subscriber based operation. There are no plans to institute a Yellowstone County fire service.

Future requirements. Because the city's fire department operations are funded almost exclusively with general operating revenues, the department has been in a difficult financial situation for a number of years. A long time problem with administration space was solved with the recent construction of a new main station near the central business district. The department will have continuing problems financing the construction of new substations and purchasing new equipment to serve the growing community. Inflation in the cost of equipment and energy have thus far outpaced new department revenue and will continue to do so.

Law Enforcement

Police protection within the Billings city limits is the responsibility of the Billings Police Department. Law enforcement in the rural county is provided by the Yellowstone County Sheriff's Department. Certain police functions are shared by the two departments and mutual cooperation during the course of police activities is common.

The city police force employs 92 sworn officers as well as clerical and secretarial persons. Because of financial constraints, manpower levels have declined approximately 10 percent from a 1977 high of 101 sworn officers. Reductions have occurred primarily in the area of criminal investigations and have not affected patrol officers. Despite recent reductions, the city police chief believes that manpower levels are adequate and general services have not been seriously impaired.(34)

The department operates 43 police vehicles including patrol cars, motorcycles, an accident investigation van, bomb van, administrative units and unmarked special detail vehicles. Typically, patrol cars are replaced every two years although rising costs and budget constraints are forcing a reevaluation of this policy. As is the case of other city departments, the deferment of capital expenditures and reductions in police department staff have not as yet caused serious impairment of services. If this situation continues, service levels will decline.

Presently, the Billings Police Department operates out of the Billings City Hall and maintains a small training facility in a separate building. The present administration facilities are in good condition with room for later expansion. Communications and data gathering equipment were recently improved and are in excellent condition. In March 1980, the police, fire and hospitals began operation of a joint communications system located at the main fire station which should result in improved service.

The city shares use and maintenance of the county jail facilities with the Yellowstone County Sheriff's Department located on the top floor of Yellowstone County Courthouse. The county jail has a legal capacity of 68 prisoners although the actual capacity depends on the mix of men, women and juveniles among the prisoners. The facility is considered only marginally adequate. In addition to capacity constraints, there are problems with the separation of prisoners and difficulties with access. The old city jail is now used for record storage and data collection.

A number of studies have been conducted over the past years investigating alternatives for enlarging jail facilities and improving police accommodations. A joint police and sheriff's facility, housing a new jail, communications office and administration building, has been proposed at a cost of \$3 to \$4 million. Such a facility would solve certain of the department's current operations problems and result in some financial savings from the sharing of facilities. Nevertheless, the city's budgetary constraints prohibit development without substantial outside assistance.

The City of Billings has not traditionally experienced a high crime rate. Violent crimes and other serious crimes declined from 1976 to 1978, but rose again in 1979. The police chief attributes this in part to higher unemployment and impact of a transient population drawn to Billings by energy employment opportunities on the area. Petty thefts, traffic violations and alcohol related offenses continue to comprise the bulk of Billings police activity.

Transportation(35)

The Billings area transportation system includes the Billings Municipal Airport, the city's public transit system and the local streets and highway

network. In addition, the Burlington Northern Railroad provides commercial rail service through Billings and Amtrak offers inter-city rail passenger service.

The Billings Logan Airport is situated approximately five miles from the central business district on the "Rims," a large bluff northwest of the city. Airport facility is entirely supported through user fees and federal grants. Airport operations do not draw funds from the city's general operating budget. Logan Airport has expanded considerably in recent years, utilizing Federal grants and local revenue bonds to cover capital and construction costs. In fiscal year 1980, operating expenses exceeded one million dollars and the airport undertook an additional \$4 million in capital improvement expenditures. With the aggressive improvement campaign accomplished over the past few years, the Billings airport has solidified its position as a regional airport.

The Billings Streets Division is under the administrative control of the city's public works department and has responsibility for maintenance and improvements of the city's 320 miles of local roads and three miles of state highway that pass through the city. In addition, the division is responsible for the development and maintenance of the city's storm drainage system. The streets division employs 31 persons and operates on a budget of approximately \$1.5 million (FY 1980).

The condition of Billings streets and roads has deteriorated in recent years as funding has not been adequate to cover the costs of needed maintenance and repair. Expenditures for asphalt, diesel fuel and other energy related items, which the division utilizes in large quantities, have risen far more rapidly than new revenues. As a result, repair schedules have been reduced and large reconstruction projects indefinitely delayed. According to the division director, the streets in new subdivisions are generally in excellent condition but many of the city's older roads are overused and in need of substantial repairs. Major renovations, including new foundation work and road bed preparation, are required but are beyond the division's financial resources. Minor repair and patching efforts represent temporary solutions but all that the city can presently afford. In recent years, most major street improvements have been financed through the imposition of special improvement districts and district-wide mill levies.

Train traffic through Billings represents only a minor traffic problem. Approximately five trains a day pass through the city causing traffic blockage. Only one coal train a day goes through the city, heading west, although more can be expected as Montana's coal industry grows.(36)

Efforts toward correcting the city's drainage problems have also suffered because of inadequate revenues. Recent developments in the Alkali Creek area, locations in the rapidly developing west side, and certain areas in the heavily urbanized older sections of the city have drainage and occasional flooding problems. The Billings Heights area, which is in the Billings urban area but not at this time in the incorporated city, has considerable drainage problems compounded by the use of individual septic systems. Should the Billings Heights area be incorporated into the city, large expenditures would be required to accomplish drainage improvements. These expenditures, an estimated \$10.0 million, are in addition to road repair costs and expenses associated with the installing of a centralized sewerage treatment.

The Billings Transit Division operates the city's bus service. Utilizing a \$1.4 million Federal grant, the city recently purchased 15 new buses and greatly expanded municipal services. The result was a 50 percent increase in usage during January 1980 compared with January 1979. Despite increased user revenues, the transit department required approximately \$200,000 in transfers from the general fund to maintain solvency. In order to generate additional transit funds, the city council is asking Billings residents to approve a 10 mill transit levy, the proceeds of which would support the city's enlarged transit system. If this levy is rejected, the city will be forced to reduce transit services or other city services.

Parks and Recreation(37)

The Billings Parks and Recreation Department oversees the development and management of the city's open land, developed parks, organized recreational programs and landscaping programs. In addition to public facilities, a number of private recreational opportunities are available within the city and large expanses of public land are easily accessible in outlying rural areas.

The city's parks director is assisted by 12 full time workers and an additional 20 seasonal workers. The city is attempting to maintain or develop a series of large community parks in excess of 10 acres, along with smaller neighborhood and miniparks for localized use. Parklands are also used for protection of unique visual areas, drainage basins or areas unsuitable for development.

Currently, the city maintains three swimming pools, approximately 35 ballfields, over 20 tennis courts and 24 separate childrens playgrounds facilities. In addition, the recreation department manages two recreational centers that include exercise groups, craft classes and programs for seniors. Cobb Field Stadium is maintained by the city, primarily for baseball, football and other spectator related attractions.

Budget cutbacks have reduced city park maintenance and development programs to a minimal level. According to the Park Director, Gene Blackwell, a number of improvements are required to bring the existing facilities up to desired standards. These include: new irrigation equipment at Pioneer Park, new parking facilities at Rose and Central Park, major renovations of the existing pools and a renovation of Cobb Field. In addition, the city holds large amounts of dedicated properties which need to be improved and utilized as local parks to keep pace with population growth. An all season swimming pool is also desired.

Billings' attraction as a regional center extends to its parks and recreation facilities. A 1970 study showed that 50 percent of the persons utilizing park facilities on a summer weekend were non-city residents.(38) Because Yellowstone County does not maintain developed recreation areas, many county residents rely on city facilities. Increased population growth in the city, county and surrounding area will place further pressure on the city's park and recreation facilities. Because these facilities generate no revenues other than a small amount of user fees, most costs are provided for through general fund revenues. Over \$2 million in capital expenditures will be required to maintain services. Potential cutbacks in federal programs that support local recreation programs further compound the department's financial problems. In April 1980, the city council approved a citywide special improvement district

which will generate \$350,000 for the renovation of Cobb Field. Other improvements remain unfunded.

The Billings area is well served by two major regional hospitals, the Billings Clinic, the Northern Rockies Regional Cancer Center, private nursing facilities and numerous private physicians. All of the facilities or services are self supporting and require no local government financial participation. The city has been supportive of the hospital's expansion plans, recently designating an area near the hospital facilities as a medical corridor, where new developments will be primarily health care oriented. Future population growth in Billings will not adversely affect health care services, nor is any local government participation anticipated in the near future.

Municipal Offices

Billings city administration is conducted out of the Billings City Hall and the Parmly Library building. The city hall encompasses approximately 26,000 square feet and provides office space for the police department, the city court and the city administrative offices. The building is nearly 40 years old but is in very good condition. Utilization of the building has declined since the division of city services in to other buildings and the recent reductions in city staff.

The Parmly Library building houses the Billings City Library, the Bureau of the Census regional office and five city departments. The library, which in 1975 became a joint city/county function supported by a separate property tax levy, occupies the first two floors. The city's planning, community development, public works, building and parks department occupy the fourth floor.

The Billings Utility Department, waste collection operations and Transit Department are housed in dispersed locations around the city where access for trucks and machinery is more easily provided.

It is anticipated that the future requirements for administrative space will be adequately filled by existing facilities. The third floor of the Parmly Library could be utilized by the city once the Bureau of the Census vacates the building. Additional space may become available in the city hall should a joint city/county law enforcement building be developed.

REFERENCES

- (1) Historical information in this paragraph is obtained from the Report of Industrial Survey of Billings and Yellowstone County, Montana. The Hock-enbury System Incorporated, 1978; and selected Billings Chamber of Commerce literature.
- (2) U.S. Bureau of the Census, Census of Population, Montana, selected issues.
- (3) 1970 population figures are from U.S. Bureau of the Census, Census of Population, Montana, PC1-B28; 1975 figures are from Billings-Yellowstone City-County Planning Staff, Population Handbook, 1975, July 1975; 1976-1979 figures are from Billings-Yellowstone City-County Planning Staff, Economic Report Billings Standard Metropolitan Statistical Area, June 1979; Billings-Yellowstone City-County Planning Department, March 1980; and BBC estimates.
- (4) Based on the Billings Urban Area Transportation Study 1973 Update, Technical Memorandum #4, September 25, 1975.
- (5) The U.S. Bureau of the Census is currently tabulating preliminary 1980 population figures. Based upon preliminary indications, 1980 Census data might be slightly lower than earlier estimates prepared by the Billings-Yellowstone City-County Planning Department.
- (6) U.S. Bureau of the Census, 1970 Census of Population and Housing, Census Tracts, Billings, Montana, SMSA, PHC(1)-23; Billings-Yellowstone, City-County Planning Department, April 1980; BBC estimates.
- (7) U.S. Bureau of Census, 1970 Census of Population, Characteristics of Population, Montana, Table 24.
- (8) U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economics Information Systems, Personal Income by Major Source, various issues.
- (9) U.S. Department of Commerce, Bureau of the Census, 1977, Census of Retail Trade, Geographic Areas, Series, Montana, RC77-A-27.
- (10) Ibid.
- (11) U.S. Department of Commerce, Bureau of the Census, 1977 Census of Wholesale Trade, Geographic Area Series, Montana, WC77-A-27.
- (12) U.S. Department of Commerce, Bureau of the Census, 1977, Census of Selected Service Industries, Montana, SC77-A-27.
- (13) Employment figures were obtained through interviews with personnel departments of Billings Public School District; City of Billings; U.S. Post Office, Billings; U.S. Department of Bureau of Land Management, Billings; and the accounting department of Yellowstone County, April 3, 1980.

- (14) Employment figures for the three oil refineries and the food processing plants were obtained through the respective companies, April 3, 1980.
- (15) U.S. Department of Commerce, Bureau of the Census, County Business Patterns 1977, Montana, CBA-77-28, pp. 1 and 4d.
- (16) U.S. Bureau of the Census, 1974 Census of Agriculture, State and County Data, Yellowstone County, Montana, Vol. 1, Part 26, Chapter IV, p. 337.
- (17) Montana Department of Agriculture, Montana Agricultural Statistics, Volume XVI, County Statistics 1976 and 1977, pp. 16 and 17.
- (18) State of Montana Employment Security Division, Department of Labor and Industries, Unpublished Four-digit SIC employment data, second quarter 1979.
- (19) County Business Patterns 1977, Montana, op. cit., p. 4 and 40.
- (20) Interview with John Willard, Regional Manager, Burlington Northern, Billings, April 1, 1980.
- (21) Coal mines with annual production rates of 10,000 tons per year or less are excluded from consideration. These small operations typically have less than 10 employees, serve only a local market, and have static production rates.
- (22) Data about individual coal developments were obtained through personal interviews with officials from each mining company during April and May 1980.
- (23) The Billings Gazette, July 10, 1980.
- (24) The allocation of Billings Urban Area coal employment was based upon the same procedures applied earlier in Table 2, Section I.
- (25) The primary sources employed in identifying Billings industries linked directly with the coal industry include: detailed personal interviews with a large sample of firms within each coal related industry group; purchasing data supplied by key coal producers in the region; and unpublished Montana Employment Security Division data by three and four digit SIC code. Appendix A contains results of the personal business interviews.
- (26) This and future comparisons between Billings SMSA, Great Falls SMSA and the State of Montana in this section were taken from the U.S. Department of Commerce, Bureau of Census, County Business Patterns 1977, Montana, CBP-N-28, various pages.
- (27) Industry group geographic service areas and the percent of business conducted within the service area were determined by personal interviews. The firm responses resulted in weighted averages.
- (28) Resident employment figures for the service area are based on published county employment estimates provided by: Employment Security Commission of Wyoming, Research Analysis Section, Wyoming Labor Force Trends, various

issues; Montana Employment Security Division, Research and Analysis, Montana Employment and Labor Forces, February 1980. Coal employment data were provided by the above employment security division through unpublished SIC data.

- (29) Population figures were obtained through the Billings-Yellowstone City-County Planning Department, March 1980; and BBC estimates. Households were calculated from person per household figures and population estimates for respective years. Worker per household was based upon labor force estimates presented in Table 2.
- (30) Information regarding the Billings water system needs was obtained during a personal interview with Gerald D. Underwood, Director, Billings Public Utility Department, February 1980; and Black and Veatch, Report on Water Utility Revenue Requirements for Billings, Montana, 1979.
- (31) Information regarding the Billings sewerage system was obtained during personal interview with Gerald D. Underwood, Director, Billings Public Utility Department, February 1980 and Black and Veatch, Report on Wastewater, Utility Revenue Requirements for Billings, Montana, 1979.
- (32) Information on Billings waste collection and disposal operations obtained during interview with Roy E. Bennette, Superintendent of Sanitation Division and Ken Hagg, Director, Billings Public Works Department, April 1980.
- (33) Information of the Billings Fire Department obtained during interview with Assistant Chief Walter Duncan, January 1980. Also Billings Fire Department, Annual Reports, 1978 and 1979.
- (34) Personal interview with Police Chief Ellis E. Kiser, January 1980.
- (35) Information on Billings area transportation obtained through interviews with Ken Haag, Director of Public Works and Clarence Crumb, Streets Division Supervisor, April 1980. Also, City County Planning Board, Billings Capital Improvements Program, 1977 and articles from the Billings Gazette, December 1979 to April 1980.
- (36) John Willard, Regional Manager, Burlington Northern Railroad, Billings, telephone interview, June 1980.
- (37) Information obtained during interview with Gene Blackford, Director, Billings Parks Department and Mike Hink, Director, Billings Recreation Department, March 1980.
- (38) Gene Blackford, op. cit.



